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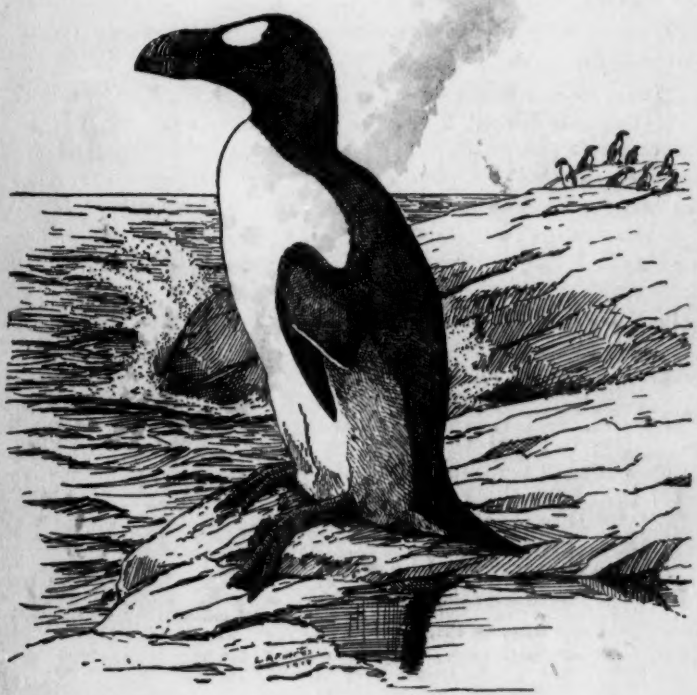

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Photos by J. Fletcher Street

OLD ROBIN'S NEST WITH EGGS OF SOLITARY SANDPIPER, RED LODGE, ALBERTA.

THE AUK:

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ON THE NESTING GROUNDS OF THE SOLITARY SANDPIPER AND THE LESSER YELLOW-LEGS.

BY J. FLETCHER STREET.

Plates XXXI–XXXV.

IT is a rare adventure to visit the nesting haunts of the Solitary Sandpiper and the Lesser Yellow-legs. In the early afternoon of the 28th of May of the present year, Mr. George H. Stuart, 3rd, of Philadelphia, and the writer left the train at the little town of Bowden, in central Alberta. Here we were awaited by Mr. Evan Thomson, who drove us across country some eight miles to his home at Red Lodge, our route lying in full view of the splendid snow-capped peaks of the Canadian Rockies some seventy-five miles to the westward.

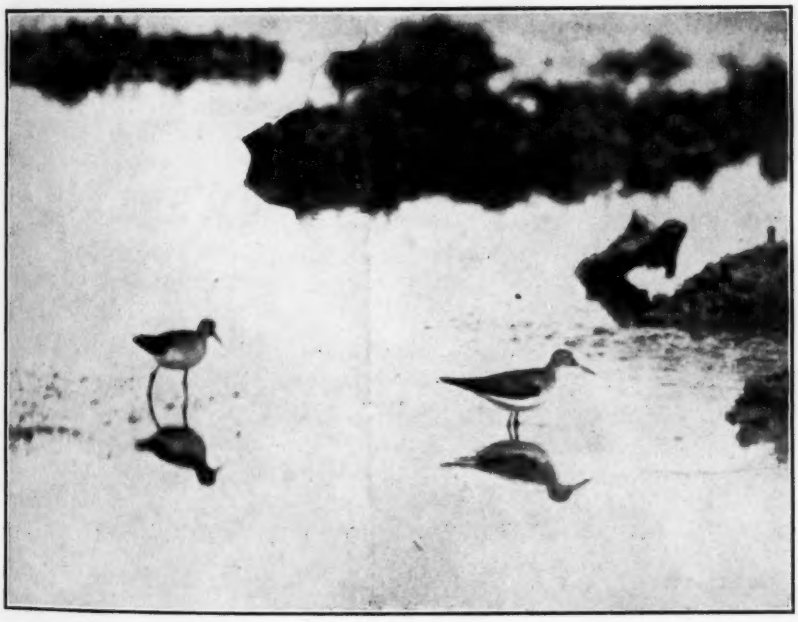
The country about Red Lodge is one of foothills with an average elevation of 4000 feet. Formerly converted more or less into a grazing country it presents large areas of rolling plains partly covered with willows and sage brush, where the Sharp-tailed Grouse is at home, and where the little streams break through, the Clay-colored Sparrow abounds, nesting in the willows. The rest of the higher ground is densely covered with second growth poplar and cottonwood while the lower, marshy areas are marked by extensive muskegs and spruce swamps.

Mr. Thomson many years ago took up a quarter section of land under the Canadian Homestead Act, built himself a log cabin at the edge of a muskeg and commenced the arduous task of clearing the land. Living alone in this wilderness without neighbors and

possessing a keen love for nature and a particular interest in the abundant wild life about him, he came to devote his spare moments to the study of birds, counting as his immediate associates such hermit species as the Great-horned Owl, Long-eared Owl, Saw-whet Owl, Goshawk and a large host of water fowl and waders. Seated one day before his cabin he noticed a bird fly to a low tamarack and enter a nest. It was ostensibly one of the waders, and great was his surprise upon examining the nest to find it the structure of a Robin. It contained four beautiful eggs, greenish white in ground color and heavily spotted and blotched with reddish-brown. Thus, on June 16, 1903, the first authentic eggs of the Solitary Sandpiper were taken but it was not until a year later that the identity of the bird was definitely established. It was indeed interesting, twenty years later, to be shown the cabin and to view the original tree from which the eggs were collected. Subsequent to the finding of this nest many others have been located, the bird evidencing no particular choice of nest in which to deposit its eggs, the list including those of the Bronzed Grackle, Brewer's Blackbird, Cedar Waxwing, Kingbird, Robin and Canada Jay. These have been found at an elevation as low as four feet and as high as forty and in locations contiguous to water and as far away as two hundred yards.

Due to a lack of rainfall during the last four or five years the amount of water in the country about Red Lodge has considerably lessened and what were once shallow ponds are now dried up muskegs. This scarcity of water has had its influence upon bird life. In places where the Solitary Sandpiper was once numerous it is hardly to be found at all, and I have never been in a locality where a dearth of lesser birds is so marked, a scarcity, I believe, partly to be attributed to the marauding habits of numerous Crows and Magpies.

On the morning of the 29th Mr. Thomson drove us to a chain of small lakes, northwest of Red Lodge, where we encountered for the first time the Lesser Yellow-legs, some six or eight birds being present at the margins of the sloughs in association with Dowitchers and Wilson's Phalaropes. Here they fed in the shallow water but gave no indication of nesting. We devoted much time to searching the bordering grass lands for their nests



Photos by J. Fletcher Street

1. NESTING SITE OF SOLITARY SANDPIPER, RED LODGE, ALBERTA.
2. SOLITARY SANDPIPERS AT CAPE MAY, N. J.

and the adjoining higher ground as well, for Mr. Thomson had advised us that he had found the species breeding upon sloping hillsides in rather open woodland. But our particular concern this day was to obtain the nest of the Solitary Sandpiper, so we made a careful search among the spruces and tamaracks of the muskeg swamps. There was a dearth of suitable nests as there was a dearth of nesting birds and the morning so far had contributed but a single Sandpiper to our list of birds noted.

At length we were taken to a likely area bordered with dense spruces and tamaracks with isles of trees towards its middle. We instituted a careful survey of all of these. The muskeg afforded rather precarious footing and our only safety in traversing it lay in the supporting layer of ice still persisting at a depth of a foot below its surface but the softness of the spongy moss-like vegetation rendered our progress tiresome and difficult.

Mr. Thomson had left us at this time returning to the wagon for our lunch and while I was hunting some distance away I heard the alarm note of the Solitary Sandpiper ring out and I knew that Stuart had located a nest. Crossing over to him I looked into a Robin's nest set four feet from the ground in an eight foot spruce which contained four of the most beautiful eggs that I have ever seen. Apparently quite large for the size of the bird they possessed a ground color of pale, greenish white and were heavily blotched and spotted, chiefly about the larger end, with vandyke brown, chestnut-brown and underlying pale purple. A few black, thread-like lines were also evident. These eggs proved to have been incubated for about six days.

The bird upon leaving the nest flew to the open bog about fifty feet away calling vociferously and tilting its body as it worked along through the vegetation, first towards us, then away, at all times giving voice to a sharp "seep," "seep," which it indulged in continuously while on the ground or from nearby trees. Its flight from tree to tree was erratic and more or less suggestive of that of a Swallow. At no time did the male bird come to join its mate. At length we withdrew and concealed ourselves among nearby trees and shrubbery. After half an hour of the most cautious maneuvering, flying from tree to tree, the Sandpiper returned and settled upon its nest. I approached ever

so cautiously to obtain a photograph of the bird but was unable to do so as she flushed while I was yet twenty feet away. Fearing injury to the eggs no further attempt was made.

This Robin's nest was one of the year before set close to the trunk upon a horizontal limb. No additions had been made to it by the Sandpipers, the eggs being deposited upon the mud lining just as the winter storms had left it.

On the following morning we visited another lake to the northward and although from twenty-five to thirty Yellow-legs were present at its borders we could determine nothing as to their nesting grounds.

Leaving Red Lodge on the morning of May 31, we arrived in the evening at Belvedere, Alberta, where we spent several pleasant and profitable days as the guests of Mr. and Mrs. A. D. Henderson. Mr. Richard C. Harlow had preceded us there by about a week. We found Mr. Henderson a delightful host in every way. His knowledge of woodcraft, his familiarity with the nesting habits of birds, particularly those of the water fowl and birds of prey, his knowledge of the surrounding country, all contributed largely to the success of our enterprise. The assistance of Mrs. Henderson, in conveying us by automobile to distant hunting grounds, and returning for us at all hours of the night marked a kindness and cooperation never to be forgotten and rendered possible several excursions which it would have been impracticable to attempt afoot.

It was gratifying to learn that Henderson and Harlow had already secured the eggs of the Solitary Sandpiper, as rare a species about Belvedere as it was at Red Lodge, and we found also that Harlow with his analytical, ornithological mind had been successful in solving the secret of the nesting of the Lesser Yellow-legs. Already two nests had been found on May 24 and the succeeding days were largely devoted to the pursuit of this species.

As Mr. Thomson had told us we found the chosen nesting site of the Yellow-legs to be on relatively high ground at an elevation from a few feet to a possible thirty feet or more above the level of the ponds. Invariably the nests were found not closer than one hundred feet from the water's edge and sometimes as far away as two hundred yards. Generally a sloping bank, a ridge or a level plateau was chosen for the immediate nesting site. No nests

Photo by J. Fletcher Street

Photo by G. H. Stuart, 3rd.

1. NESTING SITE OF LESSER YELLOW-LEGS, BELVEDERE, ALBERTA.
2. NEST AND EGGS OF LESSER YELLOW-LEGS.

were noted in the heavily forested areas; all of those secured in the region about Belvedere being found among broken hills covered with burnt and fallen timber with a second growth largely of low poplars, the burnt stubs affording excellent perches for the birds. Therefore the assumption would be that amid normal conditions the species would select rather open and high woodlands with sparse, low undergrowth within a reasonable distance of marshy or grassy ponds.

Harlow early determined that before actual incubation has commenced the birds are about their nesting grounds only at certain periods of the day, spending the greater time at the border of the ponds. On account of this it is most difficult to locate the nest. One may watch a pair of birds for hours and gain nothing from their actions indicating where the eggs are concealed. If he is particularly fortunate he may note a bird fly up and course swiftly inland to alight at length upon a stub. More than likely this action will give an index to the nest location. If the bird is intent upon gaining it, particularly if it feels it is unobserved, it may fly to a nearby stub, and then, by easy stages, approach its nest and at length fly down upon it but more than likely the bird will return to the lake without going to the ground, remaining inland only for a short period. While upon the stub it is apt to reveal its presence by giving voice to a series of calls "kip," "kip," etc., particularly if it senses that it is under observation and that its nest is in danger. It will then fly from stub to stub over a wide area, calling repeatedly and nervously picking at its breast feathers. If its anxiety is great, unconsciously, it will face in the direction of its nest far more frequently than in other directions. Again the stub nearest to the nest may be covered with a greater amount of excrement than the others.

These observations, insignificant as they may at first appear, are the only indications as to the location of the nest vouchsafed at this period of the nesting, yet they proved to be invaluable for one may hunt at random for hours over a prescribed area without success since the eggs possess a degree of protective coloration that renders them indistinguishable from their background.

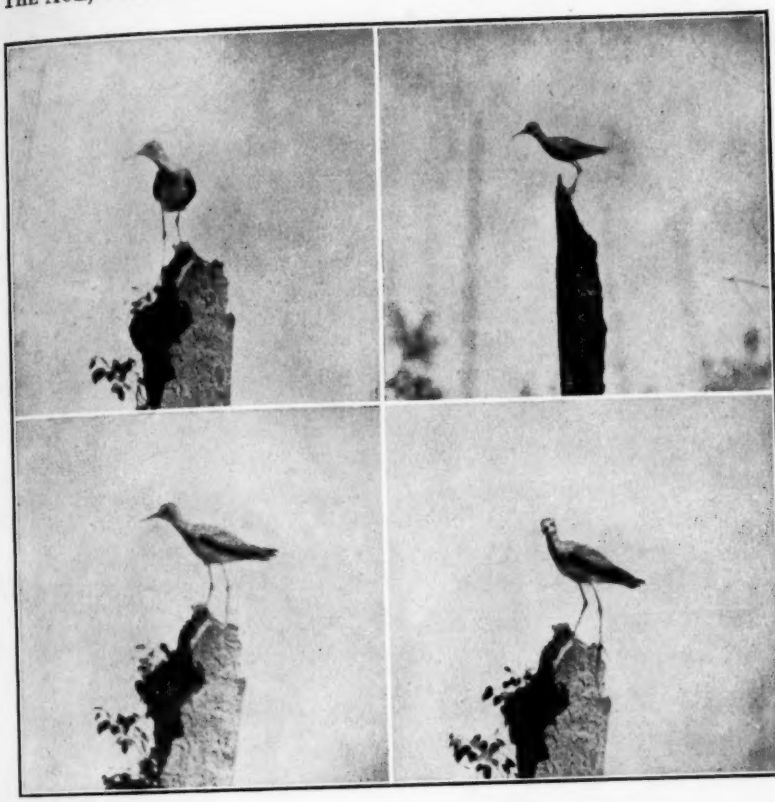
The birds at the margins of the ponds are at all times interesting. Whether there be two or a dozen a few minutes observation is

likely to reveal the mated pairs. They feed together; their interests are common interests, although the female bird may fly back to the nesting grounds unattended. They feed generally in shallow water picking particles of food from the surface or they may entirely submerge their bills as they wade in water up to their flanks. When tired of feeding one may preen its feathers with its bill or scratch its head with its foot. Again, it may sleep with its head tucked away on its back, yet no one attitude is assumed for long. There is a nervous watchfulness at all times. Either bird may give the mating call, a musical "cur-dle-lee" which is repeated very rapidly and persistently during the period of copulation as well as when the male is poised over the female on fluttering wings.

It is not until the full clutch of eggs is laid that the birds show that degree of concern which leads to their undoing. Then there is great excitement on the nesting grounds. The female bird will fly about with drooping legs and tail, keeping up an incessant "kip," "kip," and alighting upon nearby stubs. In this the male will join her, but not to the same degree, frequently, after the initial rally, flying away to the lake. His darker breast markings and slightly larger size readily identify him. If the observer retires and conceals himself the excitement of the female will gradually subside, she will fly from stub to stub, at length become silent, look about inquiringly and take a short flight to the ground and run to the nest. After settling she may be approached within four feet before flushing which she does with a loud call of alarm. While on the nest she sits low and close.

The nest is a mere depression in the ground, lined with a few leaves or a small amount of dry grass, the cup having a diameter of 3.5″ to 4.00″ and a depth of 1.25″ to 1.50″. It may be located next to a stub, along a prostrate log or in the open. Four eggs compose a normal set, yet some birds lay but three. These eggs have a ground color of pale olive-green or through greenish-buff to coffee-brown, spotted and blotched with reddish-brown, dark chocolate and underlying pale purple.

Young were found for the first time on June 4. Both male and female at this time were highly excited, the female approaching within ten feet of us. All the young had left the nest and had



Photos by J. Fletcher Street

LESSER YELLOW-LEGS, BELVEDERE, ALBERTA.

Photos by J. Fletcher Street

NESTS AND YOUNG OF THE LESSER YELLOW-LEGS.

taken refuge in the shade of a log to escape the burning rays of the sun. In length they measured 2.75″, with bills half an inch long and bluish black in color. The head was buffy white marked with patches of dark brown and black. The wings and back were deep buff with patches of dark brown and black; the underparts were soiled white. The legs and feet were very long and well developed, grading in color from ochre to olive-brown. No eggshells were found in the nest or nearby. As we retired from the immediate locality the female flew down to the ground and softly "kipped" as if to rally the scattered young. On the succeeding day a nest was found which at 10 A. M. contained one young and two eggs. At 12.30 P. M. all the birds had hatched and had left the nest being found quite a distance away. One bird was walking, readily indicating that the migration to the water must start within a few hours of the time that the young are out of the eggs.

After June 6 all the same excitement that characterized the action of the adult birds at the nesting site was transplanted to the meadow lands. One uninitiated in the ways of the species might easily suppose that he was now upon the breeding grounds for the young keep well concealed and are difficult to discover. Perhaps the exhibition of the adults at this time and the secretive habits of the birds during the early days of the mating have tended to keep the nesting habits of the Lesser Yellow-legs so long a mystery.

The "wheu," "wheu," "wheu" rally call which characterizes the species along our New Jersey shore marshes in the fall migration is an infrequent note upon the nesting grounds and is only given when the bird is in sustained flight.

By the 1st of July the Lesser Yellow-legs is to be seen upon the coastal marshes of the Middle States while fifteen days later the Solitary Sandpiper appears on the fresh waters nearby, indicating that both species occupy the breeding area for the period of nidification only.

Beverly, N. J.

THE INFLUENCES OF THE SOUTHWESTERN DESERTS UPON THE AVIFAUNA OF CALIFORNIA.

BY A. BRAZIER HOWELL.

THE following paper is an outline of a rather intricate problem which really merits the most intensive investigation. This I at one time hoped to undertake, but its consummation seems to be indefinitely postponed at present. In addition, the very nature of the problem and the character of the area involved inhibit for many years a painstaking and comprehensive treatment of the subject presented, because of lack of information relative to the precise movements of so many Californian birds during the migrations. For this reason—that the data on which some of my conclusions are based are admittedly sketchy—these conclusions are advanced somewhat tentatively and subject to later revision in some cases, but the majority seem to be fundamentally sound.

The southwestern deserts as here considered consist of those intensely arid areas of the Lower Sonoran Zone that, in Arizona, are situated west of the Babiquivari Mountains and south of the extensive Upper Sonoran stretches of Yavapai County; and in California, are situated east of the southern extensions of the Sierra Nevada and south of the jumble of mountain systems in the neighborhood of Death Valley. As a whole, this area is the most forbidding region in the United States—the most perfect desert barrier, theoretically, that we have. For vast stretches it supports only the scantiest desert bushes, chiefly creosote.

Roughly, the Californian portion of this area may be divided into two sections. The northernmost, here termed the central desert, is located to the north of the San Bernardino and Chocolate ranges, and includes the Mojave Desert. The parts of this that are located away from the Colorado River, or in other words, the somewhat more elevated portions, are particularly unattractive in appearance, with vegetation seldom vigorous even in the lower washes. On the whole, summer temperatures are high but not excessive, save in certain localities, and winter ones are often decidedly frosty. The climate is chiefly influenced by the high cordillera on the west, and probably in some degree, by the mountain ranges on the north. The southern or Colorado Desert

section resembles the other in its main characters, but the flora averages more luxuriant and diverse. Great numbers of cacti often abound, the washes support a more vigorous growth, and the low spots may boast thickets of thorny trees and several species of large bushes. The summers are burning hot, and in winter, although light frosts may occur at night, the days are usually decidedly warm. The climate here, too, is influenced by the mountain masses to the west, which deprive the region of most of the winter rains of the coast, and by the proximity of the Gulf of California, which often causes considerable humidity in summer with occasional severe storms. The deserts of southwestern Arizona considerably resemble the Colorado Desert, with summer showers even more prevalent.

The main topographic feature of these deserts is the number of small, detached mountain ranges, with evenly sloping valleys of beautiful regularity between. These may be from a few to a score or more miles wide. For the most part, these ranges are as near barren and desolate as one could well imagine, their scarred flanks reminding one of sun-mummied carcasses. Only a few of them are high enough to support meager and precarious Upper Sonoran caps upon their parched summits. In general, the trend of these is from northwest to southeast, but there are many exceptions.

Across this arid region there are two highroads of dispersal or migration which, to human eyes, would seem most logical for such species as are dependent upon a continuous water supply. One is the Gila River, which flows westward from the higher country of east-central Arizona, to join the Colorado at Yuma, and the other is the Colorado River itself, which enters the southwestern desert region from the northeast and empties into the Gulf of California. The Gila does not support an uninterrupted riparian flora (such as willows) but the drier stretches would not seem to be of sufficient size to deter the spread of most of the verdure-loving birds of the region. The bottomlands of the Colorado River, on the other hand, support an almost continuous ribbon of characteristic moisture-seeking growth, which is often in turn bordered with an especially vigorous desert flora. It is thus seen that there is a theoretical highroad between south-

central Arizona and the southeastern border of California, and that there is another north and south highroad almost bisecting the region, whose upstream extension, however, turns eastward through northern Arizona, and thus, unfortunately, it is eliminated as a continuous route from the mainland of western Mexico into the coastal sections of southern and central California. I am assuming that these theoretical highroads would be especially favorable for migratory birds other than those which prefer an arid habitat.

Prior to the inception, some twenty years ago, of extensive development of irrigation over much of the southern section, water holes were few and far between, either upon the desert floor, or in the arid mountains, and in the latter situation they were well hidden, with no verdant beacons to entice the avian traveller from afar. Hence, those species which habitually frequent rather succulent or arboreal surroundings could not have been tempted to cross this region under pristine conditions merely by wandering on and on through congenial surroundings, ever northward, and inversely at the approach of winter.

The central desert area is as yet but little altered by the hand of man except on its extreme western border, and elsewhere there is practically no agricultural development. Where irrigation is possible in this western portion conditions have been made attractive for many species of birds, and in such localities may be found a host of migrants, and probably an optimum avian population during the winter months. Although most of this is strictly within the Lower Sonoran Zone, introduced trees and developed moisture have made restricted, local environments that may contain more elements essentially Upper Sonoran in character than do the high, dry hillsides to the west that belong strictly to the latter zone. Hence, many species of birds which one would certainly not expect to find in Lower Sonoran surroundings even during the colder part of the year, wander to such oases from the neighboring highlands and are found on neighborly terms with species which normally occur about moist spots in the pure desert. In this respect our zonal problems are still further complicated.

Indications point strongly to the hypothesis that towards the close of the glacial period or shortly thereafter, the climate of

certain parts of eastern California was somewhat more humid than at present. This should mean that there was a correspondingly greater luxuriance of desert growth, with more extensive Upper Sonoran caps upon the desert ranges. Water holes would be more plentiful as well, and if these conditions obtained during the precise period (probably of great duration) when migration routes were first being established, such routes across the desert could have been fixed with less danger to the avian travellers than would now be the case. As aridity increased, these routes would not be changed in general (although they might be shortened and made more direct), but in all probability the flights between stops would merely be lengthened, and the entire distance from the Sierras to the Colorado River, say, might be made by some species without alighting.

The Salton Sea section has been flooded to sea level several times within its recent geological history, and it is quite possible, and indeed probable, that conditions at flood stage had an influence upon exact migration routes. As is well known, migrating birds are prone to follow a shore line, and this inland sea, being plainly visible from the San Bernardino and San Jacinto Mountains, must have enticed many birds, during the genesis of migration, to follow its shore line, and thence by the Alamo River (or its earlier counterpart) to the lower Colorado. The writer here follows the theory, more or less accepted, that a migration route may be somewhat altered in time, providing the new one is shorter than, and equally as attractive as, the old. This new route, once established, would probably be continued in spite of any increased aridity of climate. That it is an important highway during migration, at present, is attested by the hosts of birds that pass through the Coachella Valley. The probabilities are that it is decidedly the most important, concentrated route across the Californian deserts. More birds may pass over the central desert section, but in that area there is apparently no inducement for concentration. Birds may "hop off" from the main mountains at any point and cross to any part of the Colorado Valley, stopping wherever there seems to be promise of food.

A study of the published lists of birds for a number of stations upon the deserts, and for the Colorado River, brings to light only

ten small, migratory birds breeding exclusively in the Pacific Coast region, which may be considered, in the present state of our knowledge, as regularly migrating through, or wintering in, the lower Colorado River valley. These ten birds are:

Vaux's Swift (*Chaetura vauxi*)
Lawrence's Goldfinch (*Astragalinus lawrencei*)
Sierra Junco (*Junco hyemalis thurberi*)
California Yellow Warbler (*Dendroica aestiva brewsteri*)
Hermit Warbler (*Dendroica occidentalis*)
Tulé Yellow-throat (*Geothlypis trichas scirpicola*)
Golden Pileolated Warbler (*Wilsonia pusilla chryseola*)
Russet-backed Thrush (*Hylocichla ustulata ustulata*)
Alaska Hermit Thrush (*Hylocichla guttata guttata*)
Dwarf Hermit Thrush (*Hylocichla guttata nana*)

Other coast birds undoubtedly make this journey, but they are all of species which occur during the breeding season as far east as the 115th meridian, and hence, may enter the region by way of Nevada or Utah. In this connection, species which spend the summer on any part of the desert, even in the Upper Sonoran Zone, are not considered. The above ten species constitute a mixed lot, both as to zonal affinities and location of breeding ranges, and no conclusions can safely be drawn concerning them. It seems merely that at some time in the past, certain individuals of these species, or possibly all individuals from certain restricted areas, have, for obscure reasons, chosen to migrate across the desert.

Many Pacific Coast birds, perhaps the majority of migratory individuals, travel by way of the coast and mountains of southern California and thence into similar portions of Lower California. Numbers continue clear to Cape San Lucas, but it seems logical to suppose, as we have some grounds for doing, that others cross the gulf to the Mexican mainland at various intermediate points, which movements would have become established at some period when the Gulf of California was considerably less extensive than at present. Sundry forms (it is unsafe to hazard an opinion as to just which) as, for instance, a majority of the subspecies of Fox Sparrows (*Passerella*), evidently do not cross the desert at all, unless as stragglers, but those that leave the United States do so via Lower California. To such the desert has proven a

barrier—a wall, so to speak, reared to the east which has forced their migrations along the montanic or coastal highways. Thus, the avifauna of Lower California is appreciably enriched in comparison with what its condition would be were this desert barrier nonexistent.

It seems hardly necessary to call attention here to the fact that the deserts act as a very effective barrier against the eastward spread of many non-migratory species which now occupy the less arid country to the westward. Certain of these, as the Anthony's Towhee (*Pipilo crissalis senicula*) and Valley Quail, (*Lophortyx californica vallicola*) have pushed down into the borders of the desert and are found together with their desert counterparts—Abert's Towhee (*Pipilo aberti*) and Gambel's Quail (*Lophortyx gambeli*)—in the vicinity of Palm Springs. It seems unlikely that these San Diegan forms will ever become thoroughly established under desert conditions. Irrigated ranches now provide local environments which might prove congenial in many ways, but the combination of different conditions of climate and severe ecological competition by desert species of the same genera or like habits would probably prove too much for them. However, if such a dispersal ever does occur, it will undoubtedly be from just this point—through Palm Springs and into the Coachella Valley.

A few species of Californian birds may be able to do without a direct water supply—evidence is inconclusive on this point—but the number cannot be more than half a dozen. The remainder frequent the vicinity of ranches and oases, most of them showing a preference for such habitats as have been fostered by the hand of man, or else the tangle of natural growth along the infrequent water courses. During the last twenty years, irrigation has been enormously developed in the Imperial Valley, and to a lesser extent, in the Coachella Valley, so that there is now a line of verdure, narrow in spots, in which there is no break of more than about five miles (if we except the length of the Salton Sea) from the Gulf of California to the San Jacinto Mountains. It is logical to presume that this associational change will not alter migration routes for a great many years, if it ever does—at least to an appreciable extent. During the winter, the irrigated fields of the

Imperial swarm with Gambel's Sparrow (*Zonotrichia leucophrys gambeli*), Western Vesper Sparrow (*Pooecetes gramineus confinis*), Western Savannah Sparrow (*Passerculus sandwichensis alaudinus*) and such birds, but these have hardly been enticed from districts nearer the coast. Rather are they individuals that, were there no irrigation, would be forced to pass over Imperial Valley to find suitable range farther south. They are merely travellers of the air decoyed by green fields.

The riparian fauna of the Colorado River is, to a large extent, the same as that of the river systems of southwestern Arizona—it is Arizonan rather than Californian—and contains certain faunal elements formerly found nowhere else in California. The development of irrigation has now opened up an avenue of dispersal into the Imperial Valley. Many forms—I may say the majority—have availed themselves of this opportunity in varying degree and are now well established within this area. Indeed, some of them have increased prodigeously, and others, slower to gain foothold, will probably do so in future. As ecological congestion results within this district it is only reasonable to presume that an overflow will occur, and at least a few of the species, such as the doves, should extend into the Coachella Valley. Whether others of weaker flight can surmount the barriers imposed by the barren shores of the Salton Sea remains to be seen. If so, more individuals of these species may occur upon the Pacific slope as "accidentals," but it seems unlikely that any will become well established in the western portions of the state.

What of the deserts as a barrier to the dispersal of the indigenous birds of south-central Arizona—the Cardinal (*Cardinalis cardinalis superbus*), Pyrrhuloxia (*Pyrrhuloxia sinuata sinuata*) and Palmer's Thrasher (*Toxostoma curvirostre palmeri*), say—and even the species so characteristic of the higher mountains of that section? The three forms mentioned are birds of the heavier brush or mesquite thickets. These associational conditions are met with rather sparingly in southwestern Arizona, and the westward spread of such birds has evidently been hindered for this reason, even though one would imagine that they could easily extend their ranges along the Gila River. Although it is practically certain that the climate of *parts* of the desert was once more humid, as

mentioned above, this distributional fact seems to argue against such humidity having extended in marked degree or uninterruptedly over the *southern* deserts, for more mesquite thickets would then have occurred, which should have been followed by the extension of the ranges of some of these birds. However, it is not impossible that they did so extend but that their distribution became contracted some time later. Similarly, it seems that a marked increase in the humidity of the southern deserts (probably resulting in a zonal elevation) would have allowed some slight infusion into southwestern California of several of the Mexican tableland forms that are now so characteristic of the southern Arizona mountains, but if such an infusion ever occurred it has left no trace.

The conclusions reached are that the deserts of southeastern California introduce an arid fauna into this portion of the state, of course; that they act only as a partial barrier to migrating birds, the result being that a greater number of migrants are deflected along the mountains to the west and into Lower California than would otherwise be the case were there no deserts present; that they operate as a barrier to most of the non-migratory birds that are indigenous to the bordering regions on the west and on the east, and that they have been operative as such a barrier for a very long time; that the southern desert is being much changed environmentally by man's agency, the result being that hosts of avian individuals which formerly were forced to winter beyond the southern border of California are now enabled to remain within the state during that season; and that irrigation has enabled the characteristic fauna of the lower Colorado River valley to spread within the confines of California, and to occupy an increasingly important position in its avifauna.

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YELLOW-LEGS SKELETONS.

BY JOHN TREADWELL NICHOLS.

THE writer has been interested in comparing the skeletons of the two Yellow-legs, *Totanus melanoleucus* and *Totanus flavipes*, the skeleton of an adult male of each species taken at Mastic, Long Island, August 23, 1919, being used for that purpose.

The sternum of the former, the Greater Yellow-legs, enlarged three times, is almost exactly of the same length as that of the latter, the Lesser Yellow-legs, enlarged four times; so that by multiplying dimensions of the two by 3 and 4 respectively, it is possible to eliminate size difference and obtain proportional differences. The flaring sides of the sternum, and the shape of its vertical keel, are appreciably different in the two, the keel in the Lesser Yellow-legs shorter and deeper. The skull proper of the Greater Yellow-legs is smaller, but its bill longer, more particularly the solid tip of the bill, the upper mandible much more rigid. The leg of the Lesser Yellow-legs, on the other hand, is the longer, such greater length involving each of the three leg joints, very conspicuous in the middle one. To make a digression at this point, we may say that the skeleton of an adult male Stilt Sandpiper (*Micropalama himantopus*) was also at hand, and comparison with this unrelated bird was at times of interest. In its long legs it is the terminal or tarsal joint which is lengthened, the proportions of the joints being quite different from those of *Totanus*.

Leg comparison.

flavipes	femural 27 mm.	tibial 67 mm.	tarsal 53 mm.
× 4	108	268	212
melanoleucus	34	80	63
× 3	102	240	189

Skull comparison.

	head	bill	lumen	solid tip
flavipes	26 mm.	42 mm.	21 mm.	21 mm.
× 4	104	168	84	84
melanoleucus	32	61	22	39
× 3	96	183	66	117

An unrelated considerable difference in the skulls of the two, difficult for an untrained osteologist to describe, and which would be almost impossible to properly photograph or figure because of the concealed situation and diverse planes of the parts involved, occurs in the palate. The two longitudinal palatal troughs are deeper, higher sided in *melanoleucus*, and there is greater vertical expansion of these bones inward in that species at a point under the front of the orbit. Indeed, the palate of *flavipes* looks superficially more like that of *Micropalama* than of *melanoleucus*. These differences between the two palates are not altogether superficial; for instance, a small ossified ligament which in the Greater Yellow-legs runs downward and forward to join conspicuously with the main long stay running backward from the base of the bill along the lower side of the head, in the Lesser Yellow-legs passes inside this stay to join the bones of the palate.

The transverse processes of the ribs in the Greater Yellow-legs are broader and crookeder at the base with a distinct downward angle, differing from the condition in the Lesser much as from that in *Micropalama*. The two smaller birds are much alike here, perhaps a difference correlated with size; also perhaps with habit. The roof of the pelvis in *flavipes* curves out over the great foramen more than in *melanoleucus*. These seem to be minor differences.

Skeletal differences between these two species are sufficiently profound to eliminate the possibility of their being closely related as species go, despite their color resemblance. This fact has an inter; esting theoretical bearing. The Yellow-legs are a good example of the natural phenomenon which may be called the "two-sized form,"

the Downy and Hairy Woodpeckers present another such example. This phenomenon occurs sufficiently frequently not to be explainable by mere chance, and, at the same time, to be worth some attempt at explanation. What, then, might be a cause for such a close approximation of color in this case?

To quote from a paragraph published by the writer in 'Forest and Stream' for March, 1919:—

"Cases among birds, similar to that of the Yellow-legs, where two species are practically identical in color though differing markedly in size, are not rare. Very likely the Greater Yellow-legs is not so closely related to the Lesser as its similarity in plumage would lead one to suppose. Perhaps its similarity to that species not infrequently enables it to escape the Duck Hawk, deluded into believing it is dealing with the smaller, less active bird."

There are some facts which lend a reasonability for considering the Greater Yellow-legs a mimic. The first has to do with the economy of the chase as practised by animals of prey. It is believed that a hawk starting to hunt has a definite idea of what species it wishes to capture, just as a man has. Otherwise it would be apt to fail, as a sportsman who fires into a flock of birds on the chance that some of them will get in the way of his load, is apt to shoot through the holes in the flock. To be sure, there is not much definite data to substantiate the idea that hawks do hunt purposefully, but there is some to indicate that the Kingfisher fishes purposefully.

In 'Copeia,' 1915, pages 27 and 28, an account of an examination of the fish bones in a Kingfisher's nest indicates that its pair of birds confined their fishing to a very considerable extent to a single species of fish.

Another indication that the colors of the Greater Yellow-legs are purposely like those of the Lesser is found in the nature of this color resemblance. It does not extend perfectly to a correspondence of individual feathers and the markings of the Greater Yellow-legs are sharper and more contrasting, making its specific name, *melanoleucus*, appropriate. But how do these colors work in the field at a distance sufficiently great to reduce, to appearance, the size of the larger bird? They blend, giving the identical effect of the plumage of the Lesser Yellow-legs at lesser distance more

nearly than if the colors of the Greater Yellow-legs were in fact identical with those of that species. It is obviously not a corollary of larger size which makes the colors sharper, for we have the still larger Willet with a not dissimilar type of marking, but the marking much less sharp as well as greyer.

There is a practical disadvantage in emphasizing the structural differences between the two Yellow-legs as has been done in this paper, namely, its possible ill effect on contemporary nomenclature. There is no doubt that these differences are sufficient, quantitatively and qualitatively, to be of generic significance in many, if not most, groups of birds. However, such structural differences are obviously specific within the present genus, in spite of the fact that recent authors have considered them generic and have split that genus into many parts. It will be noted that Ridgway, although leaving our two Yellow-legs together, separates from them the Green-shank of Europe on one hand, and the Red-shank on the other hand. To apply the same criteria for species in one group as in another cannot be done. Through a long series of birds, color differences may be specific and all but slight structural differences generic. In fishes, on the other hand, it is only rarely that color is a specific criterion. In most species it is quite ephemeral, though in some cases well marked color types of adaptive significance extend across several genera. To make structure a generic criterion in fishes would do away with that convenient entity, the species; the majority of these each becoming a separate genus. It would also render fish classification entirely incomparable with that of other animals, for the species surely does exist in fishes as well as in birds or any other branch of the *systema natura.*

In conclusion, when the proportional skeletal differences between the two Yellow-legs, here indicated, have been grasped, the eye will differentiate them more readily in the field, just as an artist can portray any animal more convincingly if familiar with its skeletal structure.

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ON THE CLASSIFICATION OF THE ALBATROSSES, PETRELS, AND DIVING PETRELS.

BY LEVERETT MILLS LOOMIS.

PRINCIPAL ATTEMPTS TO CLASSIFY TUBINARES.

TAKING Dr. Coues's monograph as a starting point, the following schemes illustrate the principal attempts to classify the Albatrosses, Petrels, and Diving Petrels into genera and higher groups.[1]

The Coues System (1864–1866).[2]

Family Procellariidæ

Subfamily Procellariinæ

Section Procellarieæ
Oceanodroma, Cymochorea, Halocyptena, Procellaria, Oceanites, Fregetta, Pelagodroma

Section Puffineæ
Majaqueus, Adamastor, Thiellus, Nectris, Puffinus

Section Fulmareæ
Fulmarus, Thalassoica, Ossifraga

Section Æstrelateæ
Æstrelata, Pagodroma, Daption

Section Prioneæ
Halobæna, Pseudoprion, Prion

Subfamily Diomedeinæ
Diomedea, Phœbetria

Subfamily Halodrominæ
Pelecanoides

This system is a modification of that proposed by Bonaparte,[3] and is founded upon external characters. It is noteworthy, that Dr. Schlegel[4] assigned generic rank to the Petrel, Albatross, and Diving Petrel groups, with the respective designations, *Procellaria, Diomedea, Halodroma.*

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[1] Cf. Forbes, Voy. Chall., Zool., vol. iv, pt. xi, pp. 4–11, on the literature relating to the anatomy and classification of the Tubinares.

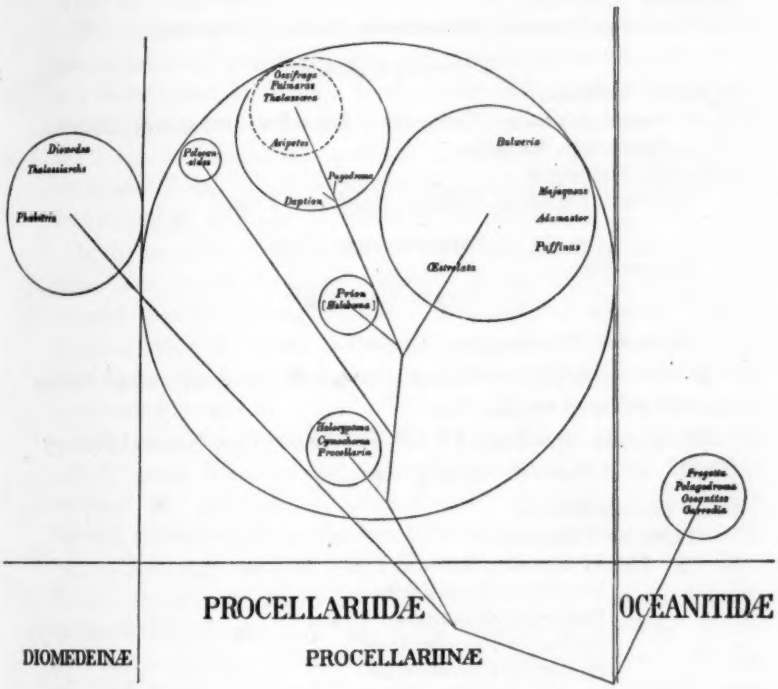
[2] Proc. Acad. Nat. Sci. Phila., 1864, pp. 72–91, 116–144; 1866, pp. 25–33, 134–172, 172–197.

[3] Consp. Gen. Av., vol. ii, 1857, pp. 184–206.

[4] Mus. Pays-Bas, vol. vi, Procell., 1863, pp. 39, 40.

The Forbes System (1882).[1]

The Forbes system was based on internal as well as external characters. The group, as a whole, was ranked as an order and Illiger's term, Tubinares,[2] applied to it.



Mr. Ridgway, in his 'Manual of North American Birds' (1887), adopted the following classification for the higher groups:

Order Tubinares
- Family Diomedeidæ
- Family Procellariidæ
  - Subfamily Procellariinæ
  - Subfamily Oceanitinæ
- Family Halodromidæ

[1] Voy. Chall., vol. iv, pt. xi, p. 61.

[2] Prodromus, 1811, p. 273.

The Salvin System (1896)[1].

Order Tubinares

Family Procellariidæ

Subfamily Procellariinæ
Procellaria, Halocyptena, Oceanodroma
Subfamily Oceanitinæ
Oceanites, Garrodia, Pelagodroma, Pealea, Cymodroma

Family Puffinidæ

Subfamily Puffininæ
Puffinus, Priofinus, Thalassœca, Priocella, Majaqueus, Œstrelata, Pagodroma, Bulweria
Subfamily Fulmarinæ
Ossifraga, Fulmarus, Daption, Halobæna, Prion

Family Pelecanoididæ

Pelecanoides

Family Diomedeidæ

Diomedea, Thalassogeron, Phœbetria

In this system osteological characters are freely employed in the definition of the families.

Mr. Evans, in volume IX of 'The Cambridge Natural History' (1899), used the following groupings:

Order Procellariiformes
Suborder Tubinares
Family Procellariidae
Subfamily Diomedeinae
Subfamily Oceanitinae
Subfamily Procellariinae
Subfamily Pelecanoidinae

In 'The Auk' for July, 1897, p. 315, and in the fifth edition of the 'Key to North American Birds,' Dr. Coues classified the higher groups as follows:

Order Tubinares
- Family Diomedeidæ
- Family Procellariidæ
  - Subfamily Fulmarinæ
  - Subfamily Puffininæ
  - Subfamily Procellariinæ
  - Subfamily Oceanitinæ
- Family Pelecanoididæ

[1] Cat. Birds Brit. Mus., vol. xxv.

REVISION OF HIGHER GROUPS AND GENERA OF TUBINARES.

In nature bird units, conventionally styled species, abound. Each unit is a fundamental group of bird individuals, which is absolutely separated from all other bird individuals by a peculiar assemblage of characters. The individuals of the Laysan Albatross, or of the White-faced Petrel, constitute such a unit.

Within bird units occur environmental, dichromatic, individual, sexual, seasonal, and age variations. Environmental variation is well exemplified in Kuhl's Shearwater and the Song Sparrow, dichromatic variation in the Wedge-tailed Shearwater and Swainson's Hawk, individual variation apparently in the Galapagos Albatross, sexual variation in the Huia, seasonal variation in the Tufted Puffin, and age variation in the Herring Gull.

In the progress of the science of ornithology conspicuous variations have frequently been mistaken for bird units, later to be reduced to their proper category of variations of units. So it happened that the sexes of the Huia were described by Gould as distinct species. Ornithologists have groped their way. Advances have been followed by retreats. Under the spell of the nineteenth century theories of evolution, the subspecies of the "American school," with the trinomial nomenclature, was evolved. It was assumed that geographic (environmental) variations are incipient species, notwithstanding the fact that we do not know the history of any bird unit and can not foretell the future of any variation having evolutionary possibilities. Of late there has been a tendency to enroll dichromatic variation in the ranks of subspecies. Moreover some systematists appear to use the term subspecies in the sense of variety, or under species without the incipient species element. In this scheme trinomials simply give a fictitious unit value to variations of units. Lastly polynomials have come into vogue; witness, "*Galerida cristata cristata* L. ≶ *caucasica* Tacz."

It is apparent that the subspecies situation is one created by ornithologists themselves, complicating instead of simplifying the study of birds. Another retreat is inevitable. We are to cease making definite on paper with trinomials or polynomials what is indefinite in nature, and treat environmental variation simply as one of the six normal variations of bird units.

Groups of bird units also abound in nature, but there is not sufficient coördination among them to permit any arrangement that is not largely arbitrary. Under such conditions, it is not surprising that systems have multiplied and that there exists to-day much diversity of opinion respecting taxonomic values.

In a classification that must be largely arbitrary, the most that can be attained is an arrangement that will simplify the attainment of knowledge. The subjoined system is a simplified one, based on differences and resemblances, and not on theories of ancestry. External structural characters are employed in the genera and both external and internal ones in the higher groups. Subgenera are excluded, for no vantage ground appears to be gained by burdening the memory with such subdivisions.

Order TUBINARES

Family DIOMEDEIDÆ

Diomedea. Thalassarche, Phœbetria

Family PROCELLARIIDÆ[2]

Subfamily Procellariinæ

Macronectes, Fulmarus, Daption, Pachyptila, Pagodroma, Bulweria, Procellaria, Puffinus

Subfamily Hydrobatinæ

Hydrobates

Subfamily Oceanitinæ

Oceanites, Fregetta

Family PELECANOIDIDÆ

Pelecanoides

REMARKS.

DIOMEDEIDÆ. The characters assigned by authors to *Diomedea* and "*Thalassogeron*" break down in Buller's Albatross, which has the base of the culmen widely spatulate and the latericorn and culminicorn separated by a membrane. The basal width of the latericorn, however, divides the round-tailed Albatrosses into

[1] Further, trinomials have been wittingly applied to bird units having a close resemblance and occupying separate areas.

[2] I do not concur with the nomenclatural ruling that displaces Procellariidæ by Hydrobatidæ.

two distinct groups. According to the current rules of nomenclature, these should be designated *Diomedea* and *Thalassarche*. In passing, it should be noted that Dr. Hartert[1] unites these groups in one genus, *Diomedea*.

PROCELLARIINÆ. This subfamily is equivalent to the Puffininæ and Fulmarinæ of Mr. Salvin and of Dr. Coues. The following is the ruling of the former:[2]

Sides of the palate without lamellæ.....Puffininæ
Sides of the palate with more or less distinctly developed lamellæ [i. e., striæ and lamellæ].....Fulmarinæ

It happens, however, that the striæ may be indistinct in the Fulmar and, according to Mr. Forbes,[3] can "just be traced" in the Antarctic and Slender-billed Fulmars, which Mr. Salvin included in his Puffininæ.

Dr. Coues[4] defined his associations as follows:

Under mandible not hooked at end.....Fulmarinæ
Under mandible hooked at end.....Puffininæ

The well hooked gonys of the Blue Petrel and of certain variations of the Prion were overlooked in this definition.

FULMARUS. *Priocella* and *Thalassoica* are included in *Fulmarus*, for the three bird units involved form a definite group with *Macronectes* on one hand and *Daption* on the other. In his 'Manual of North American Birds,' Mr. Ridgway ranked *Fulmarus*, *Priocella*, and *Thalassoica* as subgenera of one genus, *Fulmarus*. As before indicated, Mr. Salvin treated *Priocella* and *Thalassoica* as genera of his Puffininæ.

PACHYPTILA. The structural characters of the Blue Petrel do not differ greatly from those of the slender-billed variations of the Prion. Consequently, the two species are included in *Pachyptila*, *Halobæna* being eliminated.

BULWERIA. *Pterodroma* is united with *Bulweria*, for the long, wedge-shaped tail of the White-breasted Petrel (*hypoleuca*) externally links the smaller *Pterodromæ* with Bulwer's Petrel. As genera in the present system are based solely on external

[1] Vög. pal. Fauna, 1920, p. 1438.
[2] Cat. Birds Brit. Mus., vol. xxv, p. 368.
[3] Voy. Chall., Zool., vol. iv, pt. xi, p. 19.
[4] Key to N. A. Birds, ed. 5, p. 1027.

characters, absence of the accessory femoro-caudal muscle is ignored as a generic character. It should be recalled that Dr. Coues, in his monograph, relegated *Bulweria* to the synonymy of *Æstrelata* (= *Pterodroma*).

PROCELLARIA. *Priofinus* is included in *Procellaria*. Mr. Ridgway, in his 'Manual of North American Birds,' treated *Priofinus* as a subgenus of *Puffinus*, while Mr. Mathews in Volume II of his 'Birds of Australia' included it in *Procellaria*.

HYDROBATES. *Halocyptena* and *Oceanodroma* are united with *Hydrobates*. Following the precedent set in *Fregetta*, the shape of the tail is not given generic value in the present association. It should be observed that Mr. Salvin, in his monograph, placed the Galapagos Petrel in *Procellaria* (= *Hydrobates*) notwithstanding its emarginate tail.

OCEANITES. The booted tarsus proves to be a variable character in *Oceanites*, as defined by Mr. Salvin. For example, a specimen of the Graceful Petrel (*O. gracilis*), now before me, has the lower half of the tarsus indistinctly scutellate. As a whole, the long-legged Storm Petrels (*Oceanitinæ*) are trenchantly divided into two groups by the relative proportions of the feet, and these groups are here recognized as two genera, namely, *Oceanites* and *Fregetta*, the former including *Oceanites*, *Garrodia*, *Pelagodroma*, and *Pealea* of Mr. Salvin's monograph. In the present instance, no clearer view appears to be gained by elevating the structural characters of species to characters of monotypic genera.

To recapitulate: Bird units (commonly called species) and variations within bird units are realities and no theories of evolution can change their status. Genera and higher groups of birds are composed of these units and are arbitrary distinctions that should simplify the study of birds.

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RECENT EXPERIENCES WITH NESTING CATBIRDS.

BY HELEN GRANGER WHITTLE.

A PAIR of Catbirds (*Dumetella carolinensis*) favored me during the past summer (1922) by choosing, for their home, overgrown shrubbery close to my house in Peterborough, N. H. The nest was built within three feet of a window which was constantly open and was only slightly below the level of the window-sill. From the placing of the first twigs on June 13, to the hurried little parting visit of the female (?) on August 2, the whole experience was a most delightful one for me, and I think I helped to make easier the parents' duties in bringing to full maturity four lusty Catbird youngsters.

Several interesting facts were brought out. The parent birds were of course similar in appearance but the female seemed slightly larger, particularly as to head and eyes. Various little habits and mannerisms soon distinguished the birds with practical certainty even when only one was present.

The male assisted at nest building, always deferring, however, to the chief architect, his wife. When he brought material and found her at the nest he gave over his load to her for placing in the structure; but if she brought material when he was at the nest, he hurriedly got out of her way. The nest was made of twigs, felted with dry leaves, and lined with what appeared to be fine rootlets. It was not anchored over securely, and tilted somewhat with its subsequent load.

The male took no share in incubating, nor did he ever, I think, make any attempt to brood the young. If he came to the nest and found the female absent, during incubation, he would fidget on a nearby twig in a helpless, worried fashion, but apparently never thought of taking her place.

For an hour or two in the morning, on fair days, the sun shone directly on the nest. The female showed distress at these times. After the young were hatched, she would sit on the nest rim, with wings widespread (and mouth open) to shade the young. The male learned to do this only in the last day or two before the young left the nest, and then, I think, only when the female was also doing it. I secured an additional leafy branch and propped

it over the nest, to help in shading. This was accepted apparently with gratitude and no misgivings.

During incubation, the male sang very infrequently within my hearing, and brought food to the female on the nest so seldom, that I wondered how she could survive. His absences were so prolonged and remarkable that I suspected possible bigamy on his part, but perhaps such absences are the usual thing in Catbird families. Certainly his devotion during nest-building and the feeding of the young as all that could be asked. There was, however, evidence that the male of this pair was an inexperienced bird, possibly young, and this his first family.

The female, left to do all the incubating, was very faithful to her task and sat patiently day after day through an extremely rainy period, which continued with only brief respites, all through June and early July in southern New Hampshire. One afternoon there was a severe hailstorm, and the female on the nest with feathers drawn close, bill pointing straight up and eyes shut, made as good a watershed of herself as possible, while hailstones the size of large peas pelted her unmercifully.

The hurried little dashes which she made from her eggs to my back-yard bird bounty for a sip of water and for cracker crumbs led me to place a small shelf outside the window near her nest. On this, at first, I placed cracker crumbs. She made use of this nearer food station almost immediately. Then, in a quest for more nourishing food which should be to her taste, I put out in addition, small seedless raisins. For half a day she ate the crumbs and passed by the raisins, but then, in my absence, evidently tested a raisin and found it good. The male also discovered them, and thereafter only the raisins interested the birds. I tried fresh fruit, as cherries and raspberries, but they were ignored. The raisins were placed on the shelf in groups of five, domino-fashion, usually twenty at a time, that I might the more easily note and record the number taken at each visit, and the total numbers consumed per day. Before the young were hatched, the old birds ate twenty to thirty raisins a day. Most of these were taken in the early morning and just before dusk; but a few were taken at intervals all day. Not more than three were eaten at a single visit. The shelf was small and the birds took turns in visiting it.

At hungry times they made alternate visits in rapid succession. If I was neglectful and allowed the shelf to remain empty for too long a time, a peculiar, complaining call notified me that raisins were needed. The birds became very fearless and the female would remain on the nest while I pounded the window-screen to loosen and raise it and while I arranged the raisins geometrically on the shelf. Almost before my hand left the shelf, a bird would be approaching by one of several established paths through the syringa bushes.

On the third day after the last egg hatched, I saw the male thrust a raisin down one of the young throats. I was inclined to add this to his evidences of inexperience. The female did not begin to feed raisins until several days later, though she ate them herself.

For a week or more, while the young remained in the nest the family consumed sixty to seventy raisins a day. Thereafter was instituted that half neglect of the young which seems to be the accepted way of getting them so hungry that they will begin to forage for themselves. The young birds were never shown the way to the raisin shelf. Indeed they seemed to be gently but very firmly led straight away from it; first, to an adjoining garden, and very shortly entirely away from my knowledge. Could it be that the instinct of the parents was to keep this very convenient and rich food supply entirely for themselves, against later need, next year, perhaps?

For a few days the old birds returned to the shelf occasionally, from a distance, and several times carried raisins away, but their disappearance from the locality was early and complete.

The first egg was laid June seventh, the last egg hatched on July fourth. On August second, when I had seen nothing of the Catbirds, old or young for about a week,—a week during which the twenty raisins remained untouched on the shelf—suddenly I heard the familiar "quit" call in the garden west of my house to which the young Catbirds had been first removed. I hurried out, hoping the whole family had returned, but only one dark form swooped swiftly down by my house, and around the corner to the east end where the nest had been. She (I think it was the female) alighted on the shelf, hastily snatched and swallowed

three raisins, and was gone,—for the season. I am confidently expecting, however, that the memory of that raisin shelf will be a factor in their next year's selection of a nesting site.

One extremely interesting fact was noted regarding the song of the birds. The male was not a markedly good singer as Catbirds go, though he seldom spoiled his song with his cat call. He sang infrequently, also; but at such times as he could be heard singing at a little distance, the female on the nest always showed signs of excitement and restlessness. One day, as I sat close to the window, within three or four feet of her, I was amazed and delighted to hear her, while sitting on the nest, take up the strain her lord was singing. She followed it in all its intricacies, perfectly and beautifully, but in a "whisper" voice. On a later day she did a similar thing, though in briefer, less brilliant fashion. This raised several queries. Did she sing softly to avoid attracting attention to her nest? Could this particular bird have sung with loudness equal to the male's if she had chosen to do so? Do female Catbirds commonly sing? Are all whisper songs, perhaps, confined to female birds?

Next year's experience may help to answer some of these questions.

Cohasset, Mass.

NOTES ON THE NESTING OF A PAIR OF DICKCISSELS (SPIZA AMERICANA).

BY EDWARD D. CRABB.

DICKCISSELS breed very commonly in central Oklahoma, where during the early summer they may be seen in surprising numbers. Yukon, the location of the observations related in this account, is in this territory. On May 18, 1919, the writer noticed a female Dickcissel carrying nesting material, and at once decided to find her nest in order to gather data on the progress of the construction of the home and on the behavior of the family. From a place of concealment I could watch the activities of the female, who was doing all the work. Several times while busily engaged she alighted on a peach limb from which she dived into

a nearby clump of weeds. Here I naturally expected to find the nest, but failing to locate it, I realized that the bird had seen and deceived me; I therefore extended my search and the next day found the nest in another clump of weeds several yards from the one into which I had repeatedly seen her go. The nest was nearly complete when I found it. The remaining touches were nevertheless added and the lining put in by the female.

The male at no time took part in the labor. His duty seemed rather to be to furnish his mate with music, for he sent forth his gayest notes from the top-most branch of a nearby catalpa tree. Even though he would not stoop to the drudgeries of home life, he was, nevertheless, a faithful watchman, chalanging me whenever I visited the nest, no matter whether the female was on or not. On one particular occasion he was not in sight, but when I took my station under a catalpa near the nest he suddenly appeared in the branches above my head and hopping from twig to twig scolded me severely.

The female continued her work and the male his song, and on the morning of the 22d, I found a blue egg in the nest. An egg was deposited each day until the 26th, when the task of incubation began. The male sang almost continuously from sunrise till sunset while the mother bird sat quietly on her five eggs, until one morning I chanced to mow the weeds around the nest, leaving, however, a large clump to screen and protect it. When the scythe neared the nest she flew away, and of course I retired from the vicinity as quickly as possible so that she might return. As the minutes passed and she did not return, I feared that the eggs might chill, for the temperature was so low that one's breath was plainly visible.

Presently the female flew by with the male close behind, evidently pursuing her. In and out among the trees she flew with the male close upon her. Now and then she attempted to alight in a nearby tree, but the male would not relent. She was forced to flee for safety. The male continued to chastise her until she flew toward the nest and alighted on a wire just above it. Then he repaired to the top of the catalpa. The female hopped nervously along the wire; now facing one way and then the other; now looking wistfully at the nest and then fearfully at her lord and master;

meanwhile uttering petulent "cheep-cheep"s. She was afraid to sit on her nest because the weeds had been cut on all sides of it, still it was evident that she did not wish to forsake her eggs entirely; yet she was afraid to return, for glancing at her mate she flew directly away from him into empty space. He followed her like an arrow and in a few moments brought her back and did not give up the chase until she again alighted on the wire above her nest. She exhibited every sign of fear—hopping about on the wire, and calling between pants in a most pitiful manner. After continuing these antics for some time she seemed to be on the point of returning to her nest, but fear again overcame her and she took wing. The male darted after her, and in a few moments she returned in great haste. It was plain to see by the way the male pursued and viciously dived at her that he was thoroughly angered. The female, being quite frightened and nearly exhausted, soon gained a respite by again alighting on the wire over her nest. She scolded and complained, and often seemed about to resume her task but each time her nervousness prevented, and for the fourth time she attempted to escape the unknown terror by flight. But the male had no intention of allowing her to shirk her duty, so in a few moments he again brought her back. After a considerable hesitancy she resumed her sitting and almost as soon as she touched the nest the male poured forth his richest song, from his sentinel-post in the top of a catalpa.

Two days later I cut the remainder of the weeds in the vicinity of the nest, and the female left her eggs as she had done before. When she returned to the nest she manifested great fear and twice refused to resume her duties. She flew to a nearby catalpa instead of attempting to leave the vicinity, and this is perhaps why the male did not chastise her as before.

Each trip after this I found the female quietly sitting on her eggs, until I visited the nest at 4:20 on the afternoon of June 6, when I found her absent; but there were four little ones—blind, hardly able to lift their big, ugly heads, and so nearly naked that the hot sun seemed to shine clear through their little bodies. Later in the day I visited the family but since a thunderstorm was rapidly approaching and since the mother was sitting on the edge of the nest, I did not disturb them. The fifth egg was pro-

bably infertile, for the next morning when I visited the nest I found that it had not hatched.

These observations show that the incubation period of this clutch was from ten to eleven days, probably 250 to 255 hours to be more exact; for although I noticed that the last fertile egg had hatched at 4:20 in the afternoon of the tenth day, I was not sure but that this might have occurred earlier in the day, since I did not scare the mother from the nest at the time of my morning visit.

This concluded my observations on the activities of this one family. I may add, however, that I have never seen a male Dickcissel feeding the fledglings and dare say that further observations will show that he takes no part in any of the drudgeries connected with domestic life. He merely looks after the general safety of his family and compells his mate to do all the work, while he encourages her by his presence and song.

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FURTHER OBSERVATIONS ON THE HABITS AND BEHAVIOR OF THE HERRING GULL.

BY R. M. STRONG.

Plate XXXVI.

I. INTRODUCTION.

This paper gives the results of observations made since my publications on the same subject in 1914.[1] In July and August, 1917, I was located at the University of Michigan Biological Station. During this period, I had a student working on the behavior of juvenal Herring Gulls.

A few days after the work at the Biological Station was started I read in 'Science'(4) the recommendation of the Committee on Zoology of the National Research Council that the problem of "utilization of gulls and other aquatic birds in locating submarines be studied." It at once occurred to me that I ought to consider

[1] The Auk, 1914, pp. 22 and 178.

this recommendation, and I accordingly gave a good deal of attention to it during several following months. It may seem at this time to have been a very unpromising effort, but it must be remembered that the submarine problem was then appalling. No successful methods for either the detection or the destruction of submarines had been devised. So desperate was the situation that the British advised the study of the habits, even of sea lions, as well as of sea birds, along with a number of other topics in a general program of broad inquiry.

It seemed to me that Gulls, to be of any use in the vast area of submarine activities, would have to be trained to some extent. I, therefore, decided that their docility and capacity for training should be studied, also their habits as bearing upon the problem.

I am greatly indebted to Captain Robert E. Ellsworth of Michigan Patrol Boat No. 4 for a considerable amount of data given in this paper and for numerous courtesies while a guest on his boat. Acknowledgments are also due to the Honorable John Baird of the Michigan Public Domain for his authorization of my expeditions with Captain Ellsworth. The work at the University of Michigan Biological Station required facilities kindly made available by Professor George R. La Rue, the director. He was also with us on two of the trips.

The first expedition with Captain Ellsworth began at Cheboygan, Michigan, August 4, 1917. Various islands in Potagannissing Bay were visited. The trip was extended through the channels and lakes collectively known as St. Mary's River. A second expedition was made during June 19 to 22, 1919, to the Beaver Islands, and a third to Gull Island near Thunder Bay, Lake Huron, July 16, 1920.

The Gulls used in the experimental work were obtained on a short trip to Goose Island, July 8, 1917.

II. HABITAT.

The general geographical distribution of the Herring Gull has been known for many years, but the literature has contained little concerning the local distribution of this bird. I was interested in determining where individual Gulls spend their time and why. It has not been practicable to follow the activities of any single

individuals for an entire day, but I have collected data concerning the location of groups.

By far the most important factor in determining the location of Gulls appears to be the food supply. In recent years on the Great Lakes, at least, the most reliable or abundant sources of food have been connected with human activities. It is my judgment that they also determine the abundance of these birds more than any other factors. On our 1917 cruise, we found very few Gulls on bodies of water not used much for navigation, but they were abundant along the ship courses and about harbors. For a number of years I have found non-breeding Gulls collected mostly about harbors, large vessels (especially passenger boats on their course when not many miles out from a harbor), and about fisheries. It is not an uncommon sight to see good perching places, such as posts and piles of an abandoned wharf, occupied by Gulls.

Enough young are raised to the flying stage each year in my judgment to make a greater increase in the Gull population than is maintained. The supply of food is not unlimited and many a Gull must face starvation.

Heavy storms, especially during the winter months, may scatter dead fish along the beach at points remote from harbors and ship courses. At such times considerable numbers of Gulls leave the ship courses temporarily. During the period when navigation is closed, on account of ice, this is especially true.

In the spring, there is a general movement northward, and by the end of April only stragglers are to be found in the latitude of Chicago. The number of these stragglers seemed to be larger, however, during the past season or two. Both the winter and summer distributions cover a large range of latitude. It would be interesting to determine whether individuals wintering as far south as the Gulf of Mexico breed farther south than individuals with a more northern winter habitat. It is possible that some individuals may not migrate at all. It is furthermore conceivable that some strains or colonies of Herring Gulls may be non-migrating.

As has been stated earlier in this paper, it has not been practicable to follow all of the activities of individual Gulls for even a single day, but the following observations probably tell most of the story except for nocturnal activities which were discussed in previous papers.

It has been my privilege to observe these birds daily for periods of two to six weeks a number of summers on Little Traverse Bay, and especially at Harbor Springs and Harbor Point, Michigan. From our summer home porch, Gulls are almost constantly observable, while there is daylight, at fish weirs less than one half mile away. A number of Gulls may be seen at all hours of the day unless disturbed, usually standing or sitting on the group of piles that at one time supported a low dock at Harbor Springs.

Among the first sounds at daybreak are the "challenge" cries of Gulls at the fish weirs mentioned above. As twilight comes on, the Gulls about the Harbor gather in a large flock and fly off up the bay, presumably to some roosting place.

I have never ascertained whether any of these Gulls about Harbor Point and Harbor Springs were breeding, though many of them were adults. Certainly, however, they spent a large amount of time standing on the piles and fish weir poles looking for an occasional fish or any food that might turn up. Occasionally, they were seen in flight during the day, especially in stormy weather or when disturbed by intruders.

III. NOTES ON BREEDING HABITS.

(A.) *The time of laying and hatching.*—For some years, I have been interested in obtaining data concerning the time of laying, but it has not been practicable for me to visit Gull breeding places early enough to get records of the first laying. Nests with fresh eggs may be found well into July, but it is probable that so late a nesting is due to previous attempts having been failures.

Though the data available are not so complete as is desirable, there is evidence of a correlation between seasonal conditions and the time of breeding. This conclusion is supported more by observations on the stage of development of the young than by records of early laying. It is, of course, impossible to determine the time of laying by simply observing eggs in nests. Full sets may be fresh or nearly ready to hatch, involving an uncertainity of over three weeks.

Nests, with one or two eggs only, do not furnish reliable data because the eggs may be sterile or considerably incubated, as I

have found by testing. Only close observation of marked nests on successive days can establish the time of laying exactly.

Though the data given below are subject to such limitations as have been indicated in the two preceding paragraphs, they are of interest in showing that eggs had been laid by the dates indicated.

From Captain Ellsworth, I received the following records made at Gull Island, Lake Huron, May 23, 1919.

3 nests with 4 eggs	198 nests with 2 eggs
260 " " 3 "	144 " empty
3 nests with young	

I have never myself seen a set of four Herring Gull eggs.

It is clear that some eggs are laid in April because the incubation period is about 26 days. The age of the young was not estimated, but even if they were just hatched, they must have come from eggs laid in April, an earlier record than I have had. However, the season should open earlier for this colony than for most of the other colonies.

Captain Ellsworth wrote that there were "several thousand Gulls in vicinity of the island" that had "not commenced to nest." He found eleven Great Blue Heron nests.

(B.) *List of breeding places.*—Breeding colonies of Gulls have existed recently and presumably during the past summer on islands as follows.

Lake Michigan
- Gravel Island, Garden Island } near Green Bay
- Squaw, Gull, Pismire } Beaver Islands group
- Fisherman's Island—near Charlevoix, Michigan
- Sister Islands, Strawberry Islands, Hat Island } in Green Bay

Lake Huron
- Gull Island—near Alpena, Michigan
- Goose Island—Chenaux Islands group
- Several or more islands in Potagannissing Bay

Lake Superior
- Gull Island near Marquette, Michigan
- Huron Islands

Caribou Islands
Grand Portal Island
Grand Island
Various other islands not known to me

(C.) *Breeding period vicissitudes.*—We found remains of a number of Gulls which had met a tragic end. In each case a fish hook was caught in some part of the mouth, gullet, or stomach with a short piece of line entangled in bushes, tree branches, and sometimes weed stems. According to Captain Ellsworth, these Gulls had eaten floating bait attached to lines which had been torn loose from trawls by storms.

During the season of 1917, I obtained evidence that various colonies in Potagannissing Bay and the one at Goose Island suffered from egg poaching. Furthermore, a great storm May 22 to 24 combined with high water destroyed a great number of eggs of Herring Gulls and Terns. During an ordinary winter, much ice accumulates in the region of the Gull breeding places on the Great Lakes. This breaks up late, some springs, and presumably retards early breeding. On the other hand, after a mild winter such as that of 1918–19, the region of the more southern colonies does not become ice-bound. Early records are to be expected under such conditions.

While in Potagannissing Bay, we made visits to a majority of the islands on the American side of the boundary line. We found small colonies of Herring Gulls at several of these islands and some nests and broken shells. The birds were all wild and in spite of considerable searching, I was unable to find a single young Gull. The water was high, and we were told that it was eighteen inches above normal. We were informed that high water and severe storms, especially one May 22 and 24, had destroyed great numbers of eggs of Gulls and Terns. I saw many evidences of this statement being true, for instance submerged nests. I was also informed that a great deal of egg poaching by Indians had taken place.

IV. BEHAVIOR.

(A.) *Docility.*—To be capable of training, there must be some degree of docility. An intractable Gull would be useless where control is required. I was, therefore, especially interested during

the summer of 1917 when the problem of submarine detection was on my mind, in ascertaining how docile the Herring Gull may become. It was also important to learn how quickly and easily docility might be developed.

My experience with a Gull captured when adult, as well as with wild birds of other species, was entirely against wasting any time in attempts to train adult Gulls. Furthermore, it is, of course, vastly easier to capture Gulls while they are in the nestling stage. We, therefore, concentrated our attention on the young in studying capacity for training.

At a fisherman's home on Shaw Island in Potagannissing Bay, we saw three juvenal Herring Gulls which had been taken when in the down plumage stage and were, at this date, August 5, flying like adults. They were splendid specimens and they were as tame as chickens become under careful treatment. They took food from the hand even from us strangers, though a little shy of us. These birds were in the habit of flying away a considerable distance, but they returned regularly for the night and they were about the yard at times during the day.

Our young Gulls at the Biological Station became so tame in a few days that it was necessary to step carefully, when entering the enclosure in which they were confined, to avoid stepping on them. I, therefore, concluded that we need have no concern about the problem of docility.

(B.) *Adaptability.*—Intimately connected with docility is capacity for adaptation to new conditions. In fact this must exist to some extent if a wild animal is to become docile. Adaptability, of course, involves something more than just docility. A wild bird which has learned that men may not molest it must also be able to recognize new conditions, such as the man with a gun and changes in food supply.

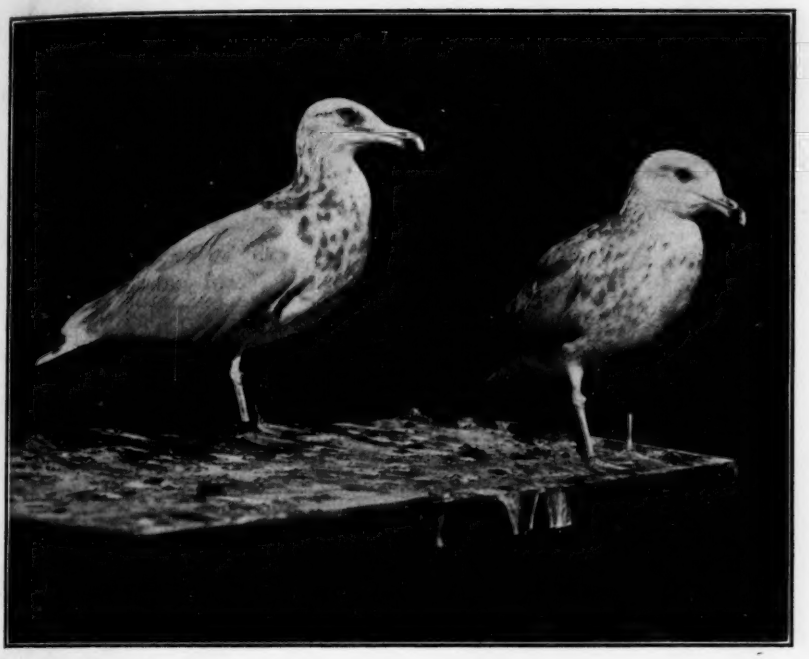
I have discussed adaptability under the topic of modifiability in behavior in previous papers, and I have little to add in the way of new observations.

During the early summer of 1921, long rafts of logs were regularly towed past our summer home at Harbor Point, Michigan, one each day in the early evening. I noticed Gulls in the vicinity of the rear of one of these rafts and with the aid of power 8 field glasses

was able to count them and even determine the approximate age of immature Gulls. There were about thirty altogether. The Gulls were actually perched on the raft with only a few occasionally in flight not many feet away. This number appeared to be, at least approximately, constant each day. I even recognized the same proportions of immatures of different ages. I got in the habit of looking for what I called the Gull express.

As the raft approached the town of Harbor Springs on its way to the saw mill, the Gulls would rise more or less together and fly away, apparently to their roosting place. I was informed by the crew of the tug towing the raft that these Gulls gathered daily towards noon about the raft at the time it was due to start for the afternoon trip to Harbor Springs. So far as I could learn, these raft trips had not occurred in other summers. So this behavior must have been developed that summer. It appeared from the testimony of the crew, and from my observations with the field glasses, that fishes were being caught in the water alongside the raft at and near the rear end. I would occasionally see movements of the Gulls which supported the statements of the crew.

(C.) *Application to problem of submarine detection.*—Many people apparently speculated on the possible use of sea birds in detecting submarines. One man had a scheme for interesting wild Gulls in submarines by scattering food from a submerged submarine. It was my judgment, however, that the chances of Gulls being in the vicinity of a ship about to be attacked by a submarine were too small. A large number of these attacks occurred at great distances from shore, whereas Gulls are found mostly near shore. I, therefore, decided that the Gulls should, if possible, be taken with the ship to be released in regions of danger. The scheme involved capturing the nestling Gulls in large numbers and giving them the attention necessary for the docility and devotion to their quarters that I believed possible for them. It was, of course, assumed that the birds would take advantage of release and fly out on the water in short trips, returning eventually to their home on the ship. Their alertness for objects in the water was depended upon for their success in locating a submarine. By careful watching, it was thought that variations in their



Photos by R. M. Strong

1. CAPTIVE HERRING GULLS HATCHED SPRING, 1911. PHOTOGRAPHED OCTOBER 19, 1913.
2. GULL CAGE AT DOUGLAS LAKE, AUGUST, 1917.

movements would at least suggest that an unusual object was in the water that ought to be avoided or at least kept in mind. It was realized, of course, that a submarine is most of the time too deeply submerged to be visible, but I was also informed that it approaches the surface when about to attack and this would, of course, be the critical time when the Gulls could be most useful.

It must be admitted that the chances of success were limited, to say the least. Nevertheless, I was informed that if the method were successful to the extent of locating just one submarine in time to save a great ship, the result would more than justify the effort and relatively small financial outlay.

The observations at Shaw Island of the tame Gulls not kept captive, the evidence of some capacity for training, and the raft performance all encouraged me in what may seem now to have been a slim chance. Very efficient methods for detection of submarines were developed about the time this scheme was under consideration, and there was, therefore, no raid on the colonies I had located.

The following notes are added verbatim from my records. They indicate how easy it is to manage the nestling Gulls.

"July 8, 1917, landed at Goose Island about 11:40 A. M., and left at 1:30 P. M. Saw many empty nests on beach especially on west side of island in northern half. Nests also back under cedar trees. Only 1 egg seen. Juvenal Gulls very hard to find. All seen were taken, i. e., seven. None of these were very old. Possibly none were more than one week—certainly not more than two weeks old. They were quiet for two hours or so in the basket but made a little noise at times on way from Mackinac Island—the hunger cry and a call of disturbance similar. I placed them under a crate that night. The next morning about 6:15, I fed them for the first time on small dead fish four to six inches long, picked up on the beach. I held the fish before the beak of each bird. It was grabbed as a stick might be in the same position. Then I shoved the fish down the throat of the bird who swallowed it readily though struggling some, naturally, when I was pushing the fish. One bird after being released regurgitated the fish. I then placed all the birds in the crate and dropped a few fishes on the ground inside, where they were picked up at once and swal-

lowed. Two had a tug of war. At the next feeding, about three hours later, I simply dropped the fishes on the ground and they were picked up and swallowed at once with much contention and tugging. On July 11, fish were placed in a pan inside the crate. The Gulls ate greedily and immediately, but the instinct to take food from the beak apparently was responsible for numerous tussles over fish when plenty were in the pan. The same thing had been noticed when fish were dropped on the ground. Apparently the smaller Gulls were less inclined to take food from the pan than the larger, as might be expected. The smaller Gulls would sometimes not take, at once, as much food as they needed, apparently waiting to take it from the beak of another or from my hand. They would do the latter, although backing off with a little fear. The birds seemed very tame."

"July 12. Gulls transferred at 1 P. M., to 1st unit of large cage. They appeared to enjoy their space and indulged in a sort of dance, jumping from both feet simultaneously and flapping wings. They also yawned a good deal in the sun. About 6 P. M. the labyrinth was placed in their cage, and a few minutes later food in a pan was placed in section 3 in sight from entrance. Some of the Gulls at once entered and others followed—all feeding voraciously as usual."

V. IMMATURE BIRD POPULATION.

For some years I have been struck with an apparent scarcity of Herring Gulls in plumages intermediate to the juvenal and adult stages. During the fall and winter, large number of juvenal Gulls are to be seen, but I do not often see Gulls in their second and third years. I had very few records until June, 1919, when I saw a number at these ages in the vicinity of Harbor Springs, Michigan. They were in the usual habitat for non-breeding Gulls, i. e., about harbors, fish weirs, and about vessels.

However, I counted only four immature birds at the above ages in a flock frequenting piles of a wharf ruin at Harbor Springs. The numbers were as follows: fifty-two adults, two in their third year, two in their second, and twenty juvenals. This count was made August 21, 1921.

It is true that these intermediate stages, especially the third year, are easily overlooked. Nevertheless, I am familiar with their appearance as the result of rearing Herring Gulls from the nestling stage to the adult, and I have had many opportunities to look for them.

VI. PARASITATION.

During the summer of 1917, some interesting observations were made on conditions of parasitation, especially by Dr. La Rue. So far as I know, these have not been published. I shall refer only to those features which bear upon Gull habits.

In planning the experimental work with nestlings, I thought I could solve the food problem by utilizing numerous small dead fishes which were almost daily swept up on the beach of Douglas Lake near the Biological Station by waves.

The little Gulls enjoyed this food greatly, and it was certainly the simplest method available, then, for obtaining their food. However, in the course of about two weeks, all of the Gulls became badly infested with parasites, especially Trematodes, and all but one died. It was eventually found that the worm causing most of the trouble occurs in another stage in one species of fish which appeared very frequently in the food. I was informed that fish in the Great Lakes do not often have this parasite.

I have seen relatively few Gulls about Douglas Lake or any other small inland lakes, and I do not know that these were breeding. This fact may account for the health of nestlings at their breeding places.

VII. NOTES ON SOARING FLIGHT.

At every good opportunity, I have continued to watch soaring Gulls, always puzzled concerning certain features of their marvelous performances. It is a common idea, even among some distinguished scientific men that the soaring so well described by Brewster[5] is done only in the wake of vessels and that so-called streamline currents are always used. I have seen Herring Gulls soaring with the wind in all directions with reference to their course, when no ship was in sight. I have watched soaring Gulls from ships for several years with this point especially in mind. Never

have I seen the soaring without a wind and the stronger the breeze, the better has been the soaring. Furthermore, the best displays have been with head to beam winds. The Gulls have soared at all points with reference to the ship, sometimes within 15 ft. of where I stood on the top deck, again 100 yards or more in front, to the side, or to the rear.

It is true that they are more often just behind the ship or in the vicinity of the stern, but I am convinced that this is because food is best discovered there, rather than for any air current advantage. It has also been maintained that an upward component involving an oblique air movement is necessary. For a number of years, I have tried, by rather crude methods, perhaps, to get evidence concerning this conception. I have watched the flapping of ship pennants when Gulls were soaring, often within several feet of them. I have held my handkerchief in the breeze, and I have observed the direction taken by the ship's smoke.

As a result of these observations, I am of the opinion that the Herring Gull often soars in horizontal winds, where there is no significant upward component.

On the morning of July 14, 1920, I was on the steamship Manitou near the northern end of Lake Michigan on the way to Harbor Springs, Michigan. We had a strong north wind which, because of our changing course, was at first a head wind but gradually became a beam wind. During this period a considerable number of Gulls accompanied us, soaring most of the time at varying distances and altitudes, but always facing into the wind. The boat was making about 16 miles an hour, and the Gulls kept up with us even when our course was at right angles to the wind. They sailed in a direction at *right angles to their bodies*, often at least 200 ft. to windward and frequently, at least that distance above the water.

I was unable to detect any differences in their wing body, or head positions from the positions occupied in a head wind. How the lateral course was maintained appeared inexplicable.

All of this time the ship's smoke was swept rapidly over and against the water. I could have more easily credited the wind with a downward rather than an upward component. The atmospheric conditions (anticyclonic) were furthermore such as

would involve downward rather than upward currents. On another occasion in the late afternoon, there was a waning westerly wind with patches of smooth water. I was astonished at the amount of soaring in so light a breeze. As the breeze became still weaker, altitude was lost and the soaring degenerated into gliding which also ceased when a flat calm ensued. I was unable to rule out the possibility of upward currents of air, but if there were any, they could not have been strong.

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[5] Brewster, W., 1912. Notes on the Flight of Gulls. Auk, Vol. XXIX, No. 1, pp. 85–92.

EXPLANATION OF PLATE.

Two Gulls in their third autumnal plumage are shown in Fig. 1. The mottling of the head, neck and breast is noticeable. The beak color has not made any significant progress towards the adult condition.

This cage (Fig. 2) was constructed in sections six feet square which were used for the top, as well as for the sides and ends. These sections are easily assembled, and they are convenient where it is desirable to have the cage stored when not in use.

THE HERRING GULLS OF LAKE CHAMPLAIN.

BY LIEUT. L. R. WOLFE, U. S. A.

Plate XXXVII.

UPON several occasions it had been rumored to me by local residents that the ever present Gulls nested somewhere on small islands in Lake Champlain. An examination of all available publications failed to give me very much information. Mr. A. C. Bent in his well known book states that, "In 1888, Mr. A. H. Jordan found a few pairs breeding on an island in Lake Champlain." I could find no other reference to the Herring

Gulls (*Larus argentatus*) breeding in the Champlain region until, while looking over some old files of 'The Oologist' for May, 1921, some writer who neglected to give his name stated that he had found the Herring Gull nesting on Four Brother Islands. A careful survey of the map disclosed four small islands about three miles from the New York shore while the nearest village was Willsboro. At once I planned to make a trip to these islands and on the morning of May 18, 1922, I left Plattsburg by train, arriving at Willsboro about eight o'clock. Repeated inquiries resulted in little information as no one seemed to know very much about the Gulls and no one had ever been to the islands. It was finally suggested to me that I go about three miles north of town to the estate of the Hatch Brothers as they had furnished food for a man to stay on the islands the previous summer. Arriving at the Hatch estate I met Mr. Livingston Hatch, stating to him that I had heard that the Gulls nested near there and that I would like to make a trip over to the islands. Mr. Hatch was very friendly and obliging; he told me that the Four Brother Islands belonged to his father, Mr. Edward Hatch, who had always had a great deal of interest in the Gulls and that for several years past he had personally hired a man to stay there and protect them during the breeding season. However, they had been unable to engage anyone this year. He was kind enough to offer me the services of his row boat and I was only too glad when just as I was pushing off he concluded to accompany me.

After about a half hour's rowing we neared the first and largest island, we were greeted by the screams of several hundred Gulls as they circled overhead. As we landed and pulled the boat up on the beach most of the Gulls left the island, going either to one of the other islands or flying off up the lake. We walked around the shore line and then made two or three circles across the center.

This island is of about six acres in area, nearly level and some thirty feet in elevation, there being a nearly perpendicular bank of twenty to thirty feet near the shore line and the comparative level surface covered with an open growth of scrub pine, juniper and a scant covering of grass. Near the east shore there is an old and dilapidated shack and several chicken coops. The shack had been used by the protector and Mr. Hatch said the coops

had been placed there originally to keep chickens but that Black Ducks had nested in them regularly for several years. They were vacant at this time, though several Ducks were seen in this vicinity. The bird population of this island was fifty-two occupied nests of Herring Gull. A few nests contained only one egg, some two eggs but the most of them three eggs. Nearly all were well advanced in incubation, except in nests with one egg, which seemed to be fresh and sets incomplete. In two nests the young were just emerging from the shells. At one nest there were two eggs from which the young were just breaking the shells, and one little fellow not over a day old. As we stood nearby, he climbed out of the nest and tried to hide under a piece of driftwood; he was replaced in the nest but persisted in crawling out and trying to hide. This was true of all of the young that were found; some seemed to be only a few hours old but were quite active and always would try to hide. The young are covered with a soft down, in color a light buff, shading to nearly white on the underparts, the head, back and wings are thickly spotted with dots of black. There was a diversity of ideas as to nesting sites, some were down close to the edge of the water, many at the top and a few feet back from the edge of the bank in open ground while other nests were close beside a stump, rock or fallen tree. The prevailing nesting material was seaweed, moss and grass. Many nests were very shapely and well built. Other birds noted were Spotted Sandpipers (*Actitis macularia*), about fifteen pairs were seen but no nests were found as it was doubtlessly too early in the season. There were estimated to be 150 Tree Swallows (*Iridoprocne bicolor*) on the island and various pairs seemed to be trying to find a possible nesting site. There were no hollow trees or stumps, but several nests were seen in cavities behind roots in upturned trees. Another site that was quite unusual was behind loose pieces of shale along the banks and just over the water. This bank was about 45 degrees in slope. The two nests found here were not completed, the composition being of grass stems and a few feathers. I succeeded in getting a picture of one Swallow just as it lit in front of the nest with a piece of nesting material in its bill.

After a survey of this island we rowed to the next which is some five hundred yards to the east. This is about four acres in area, is a gradual slope from the water on the south side to an abrupt cliff of fifty feet on the northeast and east sides. The surface is nearly flat and with a few large trees. As we landed the Gulls left, as on the first island, going either to one of the other islands or back to the colony we had left. This seemed to be the center of the Gull population; we counted 142 occupied nests; most of these were along the cliff, either on a narrow ledge at the edge of the water or at the top of and not over two or three feet back from the edge; this was the favorite location. However, there were some exceptions, several nests were seen that were on level ground and some distance from any obstacle, some beside pieces of drift and others under a bush or fallen tree. When we would sit down and be quiet for a little while the Gulls would soon start returning to the nests and seemed invariably to take a position on the nest where they would be facing the water. Frequently as one covered the nest the other, apparently the mate, would stand close by, both facing the lake and enjoying the view. As soon as we would move they would leave the nest, with several screams, make a circle or two over us and then leave the vicinity. There were about twenty pairs of Spotted Sandpipers on this island but no Tree Swallows.

From here we went in turn to the other two islands; these are both somewhat smaller than the second, and rugged, with high banks at the shore and nearly covered with pine and juniper bushes. Besides the Gull population on each island we found a Black Duck's (*Anas rubripes*) nest. The first contained twelve eggs that were just hatching, the young emerging but none completely out of the shells. This nest was in the center of a thick juniper bush, a depression in the ground with a base of grass and down. Down also around the sides of the nest in such quantity that after the female had left the nest the eggs could hardly be seen. This duck sat so close that we were within a few feet of her before she flew. The second nest contained three eggs and some broken pieces of shell; it had evidently been deserted for some reason or other. This nest was also in the center of a juniper bush, but there was no down around the nest. So it is evident

Photos by L. R. Wolfe

1 AND 2. HERRING GULL NESTS, LAKE CHAMPLAIN.
3. TREE SWALLOW AT NESTING CAVITY.

that the quantity of breast feathers is gradually built up as incubation proceeds. One pair of Loons (*Gavia immer*) were at home on the smallest island, but after a long search we could find no nest and I concluded it was perhaps too early in the season.

A survey of the four islands gave us a count of 284 occupied nests of the Herring Gull, as there were some places on the last two islands that we could not reach it was estimated that there were 325 nests in the colony. The favorite nesting site and the majority of nests were at the top of and a few feet back from the edge of a bank, cliff or steep slope. The second choice of location was beside a rock, stump, piece of drift or any article that was handy. Other nests were under an overhanging ledge and along a shelf near the water. Still others were on open, level ground or on an open sandy beach. Where the nests were beside any object they were always smaller and usually just a depression lined with grass and moss. Where they were located in open spaces and at the top of the banks they were large, well shaped platforms of weed stems, grass, seaweeds and moss, from four to eight inches high, slightly oval in shape and varying from eight to twelve inches across the longest axis. The average depth was two and one half inches. The lining was usually of water moss and grass blades. A full complement of eggs was two or three, about one third of the nests containing two, the rest three. No nests were found with four eggs. A few of the nests contained fresh eggs but most of them were well advanced in incubation. In the whole colony we only found three nests that had broken eggs; this had evidently been done by the Gulls themselves. Two Crows were seen flying near but I do not think they had molested the nests. Mr. Hatch said that he had seen several rats on one of the islands in former years but I could find no signs of them so that it seems that the Gulls have practically no natural enemies there.

Mr. Henry W. Davis, of Atlantic City, N. J., writes me that he visited these islands in 1887 or 1888 and at that time there were only 25 or 30 pairs of Gulls nesting in the colony. So it seems that they are making a nice increase, and I believe this is due to the protection and interest of Mr. Hatch.

The Herring Gulls arrive from the south just as soon as there is open water in the lake in the spring. This is usually about the last week in March. They remain until the lake is completely frozen in the fall.

At this date, December 27, 1922, they are still here.

26th Infantry, U. S. Army, Plattsburg, N. Y.

EXTRACTS FROM THE FIELD NOTES OF GEORGE B. SENNETT.

BY RUTHVEN DEANE.

I am much indebted to Mr. George L. Fordyce of Youngstown, Ohio, for the privilege of examining one of Mr. Sennett's early note books which has come into his possession, and making a few quotations therefrom. Any personal reminiscences of ornithologists of prominence are always of much interest, especially when they touch upon their early experiences in collecting and field observation.

This note book was started in 1874, evidently when Mr. Sennett first commenced active collecting, and records the specimens collected or sent to him up to February, 1877. The measurements are given in all cases and the descriptions of plumage when a specimen of a species new to him was acquired. A large number of the specimens he mounted. Up to the middle of April, 1876, most of the specimens which he personally collected were taken in Crawford and Erie Counties, Penna.

On April 15, 1876, he started on his first collecting trip and joined his correspondent, Mr. Jasper N. Sanford of Elbow Lake, Grant County, Minn., who in 1878 accompanied him as assistant on his second trip to Texas. Here he remained until the end of May, collecting many of the Ducks, Cranes, Pelicans, Grouse and many species of waders, all new additions to his collection. While his facilities for preparing his specimens were very primitive, he mounted a number of his largest species and sent them home in crates. It was not until May, 1875, that he began to form a col-

lection of nests and eggs, but this note book records eighty-five sets up to February, 1876.

It is interesting to read of the collecting of such birds as the Whooping Crane and Passenger Pigeon, which were not uncommon when Sennett collected in Minnesota nearly fifty years ago, though one is now on the border of extinction, while the other has gone forever. I have never read the journal of a scientist where the writer showed more real enthusiasm in his chosen study, as the following extracts will show.

Nov. 17, 1874.

Having hertofore experienced great difficulty in not knowing names and terms nor even anatomy, I have ordered and received Dr. E. Coues' 'Key to N. A. Birds.' With it to study, I shall hope to be able to classify more correctly and more fully.

Dec. 8, 1874.

This day worked very hard and hunted thoroughly but got only one Merganser, one Downy Woodpecker and two Titmice, last two at one shot, but twenty feet apart. Shot a number of times at long range, but made poor shooting today. Was using up old powder that I know was inferior and presume I had better have thrown it away. Will use none but Orange in future. Season holds on well but game and birds are scarce. I think first severe storm of last month drove everything south. Well, ought I to complain! Here I have already skinned more than double the number of birds I had expected to at this time and I am beginning to feel at home in it, though I am awfully slow at it.

Dec. 16, 1874.

With a southwest wind and clear and three inches of snow, gun in hand, strolled through orchard and back of lot to Rilling's woods. Saw a female Downy Woodpecker within ten feet, backed off as far as I could and still see it, and shot it all to pieces with No. 12 shot, feel the want of dust size but none in the city. I disliked to have to throw it away for I had no female of this variety. Was tempted to shoot a Black-capped Chickadee and shot its bill and one wing to pieces and had to throw it away. It seems as if I am destined today to spoil every specimen.

Feb. 11, 1875.

Saw eight Pine Grosbeaks together on locust tree in front of house and my gun being at factory for repairs I borrowed a muzzle loader of Gloth and followed birds down to mountain ash trees by the large elm, had two fine shots at males which were bright red on head and neck, but both barrels missed fire. I came near getting mad but I watched the birds fly over to the orchard and by pounding and ramming and putting on fresh primers I managed to mark them and quickly firing I got one from each barrel, although both hung fire. They were both females.

March 6, 1875.

Went out this morning before breakfast with gun to see if any Pigeons were flying. Found ground frozen so as to hold up my weight. Saw no Pigeons, shot one Crow on the wing. Before noon had flurries of snow, which ended in a heavy snow storm from the west. The poor birds must have been fooled by their prophets.

March 29, 1875.

Referring to a Crow he had shot, he says: "This is the fattest bird skinned since Mergansers last fall, and the old adage "As poor as a Crow" don't work always.

April 3, 1875.

No. 170, Wild Pigeon, male 16½ x 24 x 8, tail 8, eyes orange red. Found winged in upper lot, bill black, legs pink.

April 14, 1875.

No. 192, Wild Pigeon, female. Shot in orchard. Abandoned, by all odds the fattest bird and when I had it ⅔ skinned the skin cuts and shot wounds were filled with fat and I knew it would be worthless.

April 17, 1875.

Wife and I have labeled and completed all up to No. 177 excepting two numbers 23 and 39 which I cannot with certainty name. They are evidently young. I have studied them more or less all winter but must wait until I get more specimens to compare. A change in the weather today, snowing nearly all day and last night, the therm. standing at 10°. Sleighs in town today and Butter Ducks and Geese on the bay in abundance.

April 24, 1875.

Had a big hunt today on island in a driving snow storm and secured a large bag of birds, mostly Ducks. Did not see a Snipe. My man Harrison went along. He has learned of me to skin birds very well and has already about twenty good skins.

Oct. 26, 1875.

No. 421, Bittern, mounted. I think I have mounted this the best of any bird yet, but I get out of conceit with all the birds yet mounted and presume I shall of this when I am better able to see defects.

Jan. 18, 1876.

On Dec. 20, Sennett went to Chicago with some of his family to visit relatives and while there picked up in the markets Pinnated and Sharp-tailed Grouse, Geese, Quail and a poor specimen of the Bohemian Waxwing selected from a bunch of eight. He writes, "Made the acquaintance of Dr. Velie at the Academy of Sciences and was very much pleased with the collections and the Dr. saw also Wood's Museum and the peculiarity there was two very handsome trained and tame Otters from Michigan. Met Master Geo. F. Clingman, an enthusiastic young tyro, who is doing nobly and has shown great perseverance in collecting eggs during the past season. Fred. Kaempfer's bird store is the finest I ever saw.

Mch. 9, 1876.

No. 471, Wild Pigeon, male, mounted. Shot on Gingrich's Farm.

On the 11th the weather was very mild and the air was full of Wild Pigeons and all the trees were alive with Robins, Blue Birds, Blackbirds, Meadow Larks, etc., and today, the 13th, there is 6 inches of snow and freezing cold.

Mch. 29, 1876.

Snow 8 or 9 inches deep and snowing constantly. The heaviest snow since December. In Chicago the drifts were so immense as to blockade completely all street car travel. In New York and New England heavy rains to cause floods. Good sleighing.

April 11, 1876.

No. 482, Wild Pigeon, male, mounted. Shot in yard.

Elbow Lake, Minn., Apl. 27, 1876.

Jasper and I worked faithfully all day skinning the two White Pelicans shot yesterday. Found in the gular sacs of all the Pelicans groups of lice or ticks close up to the head, which seem to eat through the sacs in some places. In one sac I think we took out as many as 25. In specimen 499 found quantities of slender white wiry worms 1¼ in. long in air cells on belly where it had been shot. Both ticks and worms I put in alcohol with the lizards. Saved three wing bones of Pelicans. Got three Yellow-headed Blackbirds at one shot.

April 28, 1876.

Saw a large flock of Sandhill Cranes flying high over the house, in which were two Pelicans. I saw the Pelicans leave the straight course they were all taking and commence sailing in their graceful circles and immediately the Cranes followed suit and continued so to sail until out of sight. This is unusual. Jasper had never seen the Cranes follow Pelicans as leaders before.

May 2, 1876.

Took the gun and paddled alone across the lake, which is close by the house, to the woods on opposite side. Saw a Swan and quantities of Bonaparte's Gulls flying over the water Shot a Pigeon Hawk from door yard. A man from Pomme de Terre brought me a Franklin's Rosy Gull, but it was in the worst condition I ever saw a bird that wanted skinning. Water and plaster soon made it look quite respectable and it is one of the rarest skins to me yet received. The day was fine and warm, but at 10 o'clock P. M. a severe snow storm set in from the north east.

May 20, 1876.

Beautiful morning, up at half past four, breakfast over by six, cleaned guns and loaded shells. Jasper started towards the west, I staid in camp to take care of skins. Had nearly caught up when Jasper came in loaded down with two Whooping Cranes and a beautiful rabbit, a heavy load together with gun to bring over two miles. It was a grand sight to me for

we had been longing for the white beauties for a long time. He crept onto them on the broad open prairie and shot the pair. It is not every one who can shoot these fellows with shot.

May 21, 1876.

Up at six. We had to shoot our breakfast. What we ate was 3 Upland Plover, 1 Godwit, 1 Blue-winged Teal, and 1 Gadwall with coffee, no bread or salt, game roasted on spit, indian fashion. Jasper found yesterday a White Crane's nest and old ones near it. We concluded that I should be concealed close by the nest while he went on to Hanson's, eight miles, for team, and if the Cranes could not count I would get a shot. The nest was in a burnt slough on a small rat house and in plain sight and only a few tufts of short grass anywhere near. By lying flat by one of these tufts and cutting all the rest to cover over me I was partially concealed. I took as comfortable a position as possible and bid good by to Jasper who was soon whistling on his way.

Fully half an hour went by and I began to cramp and feel uneasy and was on the point of changing my position at the risk of loosing my covering by the wind, when one noble fellow flew over the slough and lit on the opposite side from me about two shots off. Cautiously he began to survey the situation and shortly his mate came swooping down to his side. They kept their eyes well on my bunch of grass and remained a safe distance, yet I could see they knew their eggs were safe. Some fifteen minutes of strutting back and forth when she boldly walked out into the water, some eight or ten inches deep, directly towards me, mounted the rat house and sat down on her two eggs, some twenty five yards from me in plain sight. I could see her wink her eyes watching me and her mate constantly. Her eyes gleamed like fire. How anxious and how handsome, was ever a sight so grand, I forgot all about being tired and was almost spellbound. The male stood on the ridge watching her closely for a few minutes, when feeling all was safe he calmly commenced to plume himself in grand style and shortly walked off away from me the proudest of birds. When nearly out of sight I knew all hope of getting him was gone. If I could have secured him I would not have disturbed her or the eggs until Jasper returned with the team, for I thought of taking the eggs home to the Sanford's to try and hatch them under a hen, but now I concluded to secure her.

I slowly arose, turned and gave her one barrel as she was rising from the nest and the next before she had gone six feet and dropped her in the water. I immediately scratched for grass and tried to hide for I knew her screams would bring her mate and already he had answered and was on wing and came swooping down to where he had parted with her on the bank. I had already put in shells but he was too far and I hoped he would come nearer, but the wounded bird rallied sufficiently to get to him and start off on the prairie with one drooping wing, and catching between her legs would throw her every few steps, I was obliged to give chase, and a lively one it was, but the male kept at a safe distance and such a fuss never was heard. I at

length secured her but her wet feathers on the burnt prairie did not enhance her beauty. I took her back and put her on the nest to remain until the team should come.

Sept. 17, 1876.

Went to Philadelphia with wife and daughter to attend the Centennial Exhibition. Saw a splendid collection of beetles and butterflies in the Brazilian department. In the Kansas and Colorado buildings saw Mrs. Maxwell's collection which was praised by the papers so much. Was disappointed. It was large and showed much energy and skill, but as for art it fell short of its reputation. Many specimens of animals were too poor specimens of the species to be mounted by anyone. Her birds and skins were in poorer shape still. The crowds around it were immense and the praises of the multitude were many, but to one who is anything of a critic they are considered as inferior. In the Agricultural Hall saw some very good work from taxidermists, in fact this building contains all that was very fine excepting Smithsonian and Ward's in the Government building. The exhibit of F. J. Egan of Halifax, N. S., was very good. Splendid Eagles $75 per pair, by G. F. Nowell, Hamilton, Ont., also Eagle and Blue Heron same price and by same man. Fine pair of Cariboos $200 and Moose head $110 by F. J. Egan of Halifax. Mink and Ermine $15, Wild Cat $15, by J. H. Cornell, St. Johns, N. B. Fine case of Roseate Spoonbill and ten other common birds, well mounted $75, by C. K. Howlett, Hudson, Ohio. Best case of fancy birds was by Pertia W. Aldrich, Bluehill, Milton, Mass. But the chief attraction by all odds, the finest show both as science and taxidermy, was that of W. H. Werner of Allentown, Pa. I should think he had about twenty-five groups of pairs, young, nest and eggs, each group under glass globes. At the Zoological Gardens saw a fine Flamingo and Sandhill Crane, also Toucans and Cock-of-the-Rock. All of the birds, animals and reptiles in very fine condition. The number was not as large as I expected to see. Splendid Rhinoceros, also Giraffe, Laughing Hyenas and African and Asiatic Porcupines. Fine village of Prairie Dogs.

Jan. 14, 1877.

Saw more Snowy Owls and had more offered than ever before. I presume at least a dozen were shot in this vicinity in November. Sent a Yellow-head and nest and eggs to H. B. Bailey, Newton, Mass. Have opened a correspondence with him. Have sent some eggs to F. S. Webster of Troy, and expect some in return. Have ordered a large new case, also one for eggs. Am thinking of going to Florida. A. B. Chase of Norwalk is going. Dr. Hatch of Minneapolis made me a fine visit in October. He has a friend in Manatee, Fla., by the name of N. B. Moon and if it is convenient for me to go to him I will do so. Sent J. N. Sanford Coues' 'Birds of the North West' and he is delighted with it, also sent him a lot of paper boxes for shipping. Mink skins with him are only $1. I have sold some for him to advantage and have sent him some money to buy 50 or 60 for

a cloak for wife. Am to get Jasper a gun and he is to, during the coming season, collect for me birds, eggs, and young. Expect to do wonders this coming spring. In the meanwhile I have an abundance of reading and corresponding besides some of my western animals to mount.

Jan. 30, 1877.

Went to Rochester, saw Ward's collections, also met Prof. Howell who is now a partner of Mr. Ward. Saw their very complete work shops employing 18 hands. Mr. Ward is now in Africa collecting. They have few birds and do not wish them. They have, I should judge, a hundred Rocky Mt. Sheep just received and skins by the hundred of other animals. Their great specialties are minerals, antiquities and skeletons. Prof. Howell was very obliging and I was greatly benefited. Went from there to Troy and found Mr. Webster with open arms to receive me. Our correspondence has been quite animated and profitable and for the first time we met. Found him not only a good taxidermist but an observing and careful naturalist and scientist. He is a great worker and has some very fine specimens. Staid one day with Mr. and Mrs. Tucker. I could get away with difficulty. Mr. Webster went with me to the State collection at Albany. It was very good but not as good in birds as in other departments. Met there Prof. James Hall and presented him with two specimens from Dr. Ingersoll of Erie. Met also Mr. J. A. Lintner the entomologist and there beheld the finest collection of moths and butterflies I ever saw. I think his system of arranging complete and Mr. Webster and I both agreed to adopt it forthwith and begin the study of insects with more ardor.

Went to New York and spent half a day in the aquarium, was delighted with it. Saw the two live Vampire Bats which I supposed could not be domesticated. Many and choice were the fish and radiates. The next day spent the entire day at the American Museum and Menagerie at Central Park. It was the closed day but I was admitted and met Prof. Bickmore and Dr. Holder of the Museum and they gave me much attention and made me interested beyond expression in their work and collections. I was indeed surprised to find so much. They are over crowded and expect to get into their new building in the spring. Mr. Conkling, Supt. of the Menagerie, also gave me special attention and I was much pleased with the animals. I received the reports from all and was delighted with my day's study. I neglected to mention that at the Troy Cemetery I saw the finest lot of live water fowl I ever saw. Five or six species I knew, several of the Geese, among them were Snow and Egyptian, Brant and among many ducks were the beautiful Wood and above all the exquisite Mandarin. They were all huddled together, at least a hundred, in a small open space in the ice, and were tame and well. Arrived home and found a letter from Dr. Elliott Coues urging me to go to Texas, and I have concluded to do so, and Mr. Webster will go with me.

Feb. 15, 1877.

My correspondents are Dr. P. L. Hatch, Minneapolis, Mr. H. B. Bailey, Newton, Mass., William Brewster, Cambridge, Mass., Dr. J. C. Merrill, Fort Brown, Texas, who welcomes me to his section, and last but not least Dr. Elliott Coues of the Smithsonian. Received a letter through Mr. Bailey from Mr. J. A. Allen of Cambridge. Sent Dr. Coues a fine Pelican and he was pleased with it and gave it to the Smithsonian, also sent him a juv. rabbit which he decides to be the young of northern Jack. He sent it to Prof. Allen who is making a study of Rabbits.

Feb. 19, 1877.

Received a letter from Spencer F. Baird of Smithsonian Inst. thanking Dr. Coues and me for the Pelican skin I sent the latter, and saying he had sent me a check list of birds.

Feb. 21, 1877.

Have been ready and waiting for two days for Mr. Webster, expect him every train. Was today studying Audubon about the Mammals and Birds of Texas and have hopes of getting great quantities of valuable skins. Every thing arranged at home, debts and accounts all settled up and every thing put away in good shape.

112 W. Adams St., Chicago, Ill.

SOME OBSERVATIONS ON THE STRUTHIOUS BIRDS.

BY W. HENRY SHEAK.

For seven months in 1918, from the first of April to the end of October, I had charge of the Ostrich house at the Philadelphia Zoölogical Garden. This paper is based almost exclusively on notes made at that time.

When I took charge there were in the house three specimens of the South African Ostrich (*Struthio australis*), two males and one female; two Somali Ostriches (*S. molybdophanes*), a male and a female; two Rheas (*Rhea americana*), both males; one male Australian Cassuary (*Casuarius australis*); two Papuan Cassuaries (*C. papuanus*), a male and a female; and two Emus (*Dromæus novæ-hollandiæ*), both males. During the seven months I was there I had no death and not a case of serious sickness among the ratite birds.

Toward the end of the summer, however, we received from an Ostrich farm in California three specimens of the Somali Ostrich,

a male and two females. These were young birds, but almost, if not altogether, fully grown. The birds were delayed in their long trip across the continent, shamefully neglected in the matter of food and water, and when they reached the Garden were in a dying condition. The male was so weak he could not hold up his head. Of all pitiable sights, an Ostrich with the strength all gone out of his neck, this long member as limp and resistless as a carpet rag, permitting the head to fall and lie helpless on the ground, is the most pitiable. The male was too far gone to take any nourishment and died within three hours after his arrival. The two females after being liberated from the shipping crate and stretching their cramped muscles for a quarter of an hour, began pecking at the mash of cracked corn and bran which I had prepared for them. Before night they were eating ravenously.

The Ostrich farm shipped us a second male which arrived about a month later. He reached us in a condition similar to the first. Superintendent Robert Carson, Assistant Superintendent C. Emerson Brown, Head-keeper Manly, and the writer spent a September morning trying to induce the new arrival to eat, and with little success. Not one of us had much hope of saving him. But after a few hours he did take a little food, in a day or two was eating readily, and by the end of October he and the two females received earlier were in good condition and well on the way to complete recovery.

These new birds were not placed in the Ostrich House, but in a new paddock prepared especially for them south of the new Bird House. The paddock was provided with a shelter house, but with no artificial heat. Here these birds remained all winter and thrived. One of the females died subsequently, but when I last visited the Garden, late in July of the present year, the other female and the male were still living and in the best of health. This species has been found most satisfactory on the Ostrich farms of America, and is kept almost to the total exclusion of *S. camelus* and *S. australis*.

The Ostrich house is provided with a boiler for steam heat, but it is only in extreme weather that it is used. The winter of 1917–18 in the region of Philadelphia was a record-breaker for frequent and heavy snows and low temperatures, but every day

the struthious birds were given the freedom of the outdoor paddocks, for at least the warmer part of the day, excepting on a few occasions when the ground was a glare of ice and there was danger of the birds falling and breaking their legs. This applied to Ostriches, Rheas, Emus, and Cassowaries alike.

One of my most striking and interesting observations on the ratite birds was that they all love rain. On the occasion of a shower, every bird, instead of seeking the shelter of the house, would dash out the door and dance about in the rain. The harder the downpour the more they seemed to enjoy it. After the first transport of pleasure, they would settle down to the regular business of picking edible tidbits or pebbles from the ground of the paddocks. I never knew them to go under a roof to get out of the wet. This would not have been surprising in the Cassowaries, as they affect deep woods where rains are frequent and heavy, but it was certainly unexpected in the African Ostriches which live on deserts and plains where rain is practically unknown.

Another surprising fact about these great birds is the small amount of food upon which they can not only subsist, but thrive. The principal caution Head-keeper Manly gave me when I went to the Ostrich House, was this: "If you see the need for it, *decrease* the feed, but *never* increase it." The bill of fare for the Ostriches the year around, was two quarts of alfalfa, one quart of cracked corn, and one quart of bran to each bird in the morning as soon as the cages were cleaned, and again in the evening just before closing time. In addition to this, I fed each bird in the evening one quart of chopped carrots, beets, and bread, equal parts. To the Emus, Cassowaries and Rheas I fed, morning and evening alike, to each bird, one slice of bread, three medium-sized bananas, one-half pint of boiled sweet potatoes, one apple, a little boiled rice rolled in corn meal, and a little lettuce.

When we consider the great size and bulk of body of these birds, this is certainly a small ration. But this is not all. Whenever my birds began to show any decided signs of being "off their feed," by leaving a part of their ration in the feed boxes, I would eliminate the evening meal altogether until they would clean up what I gave them in the morning.

As was to be expected, these great birds have their own individualities, their own idiosyncrasies, their own likes and dislikes, very much as human beings. For instance, I had one Emu that would not eat bananas (and I could not get him hungry enough to eat them), although my other Emu, the three Cassowaries, and the two Rheas were fond of them. Some of the birds were very dainty about their eating and rarely ate all I gave them, while I had one big South African Ostrich which not only ate all I gave him, but usually ate what the other Ostriches left in their feed boxes. Although red beets were on the bill of fare for the Ostriches, they cared little for them, and always ate everything else in preference to the beets.

In each cage was kept an earthen vessel filled with ground bone, crushed shell, and grit, and each struthious bird received a little fresh chopped bone and meat every Monday and Thursday. I was surprised to find the Cassowaries, especially the Papuans, picking up the pebbles when the cage floor was fresh sanded each morning, and swallowing them. This was hardly to be expected in a bird not a seed eater, but supposed to subsist exclusively on fruit, vegetables, grass, and the like. The Emus and Rheas also gathered pebbles.

One morning I was walking through the service passage back of the cages, when I saw a mouse that had been caught between a bar and the feed box in the cage of the female Papuan Cassowary. Thinking that possibly the mouse had gotten poison or died of some disease, I stopped to get him out of the cage. But the bird discovered him at the same time I did, and before I could reach the rodent, she seized him in her bill, shook him as a terrier shakes a mouse or rat, evidently to make sure he was dead, then gave him a toss and swallowed him.

A little later I tried the Cassowaries with dead mice which I had caught in a trap, and the Australian as well as the Papuan ate them readily. I then put a mouse into the west Emu cage, but it lay there for some time. Then I put it into the feed box of the Emu in the big center cage. When let in from the paddock, he picked the feed from under it, seeming not to care for the rodent. I did not feed the bird that night and do not know if he ate the mouse or not, but the next morning it was not in the feed box.

I told Mr. Hess, for more than thirty years keeper of the Reptile House, about my experience with the Cassowaries and the mice, and he said, "Oh yes, they are very fond of them." He told me, too, that before the Ostrich house was built, several Cassowaries were kept in the Antelope house and Elephant house. They were "off their feed" and got poor. George Harrison, one of the old keepers, cut up raw bone and the marrow and gave it to them. They ate of it ravenously. Their health picked up and they got fat. The females began laying and laid a large number of eggs. Harrison also chopped up oyster shells, thrown out from restaurants and hotels, containing a little meat, and fed to them. He would also burn charcoal for them. From these facts it would seem that the Cassowaries are not in their native state so exclusively vegetarian in diet as is commonly believed.

Under the old system of feeding, when Arthur Erwin Brown was Secretary of the Zoölogical Society, the African Ostriches received more green stuff, lettuce, cabbage, etc., than they do under the later regimen. Then the females would lay an egg every alternate day for long periods of time.

For a long time I could not find that the male Somali Ostrich ever drank any water. His drinking vessel was never more empty than might be due to evaporation; there was never any water splashed about it, as was almost always the case with the other Ostriches, and I never found him at the water. This was true even in the hottest weather. But, finally, one morning about the first of September, I caught him at the bucket apparently drinking. But he took a few sips only. This was a clear, sunshiny day, but not very warm. He never mussed his cage much. The three South Africans always had a litter of sand and other dirt kicked up on the footboard of their cages, and considerable out in the front service passage, while the Somalis had very little.

The Rhea has the best developed wing of any struthious bird, and frequently goes about with the wings lifted from the body, as do also the Ostriches. This is never done by the Emu or Cassowary. The skeleton of the Cassowary shows the wing bones feebly developed, but never having examined a bird in the flesh, I do not know if the wing is free from the skin of the body or not.

Both the male and female Ostrich make a hissing sound, but the

male only makes the sound called "booming." He possesses a gular air bag capable of considerable inflation. The sound is not produced by forcing the air *out* of this bag, as might be expected. On the contrary, the bag fills as he utters this boom, enlarging with the first coarse note, beginning at once to subside, but the subsidence is arrested by a second boom, when the gular bag is enlarged more. A second subsidence is arrested by a third boom, when the bag is enlarged still more. The booming may end with the third note, or there may be a fourth, after which the bag gradually subsides. Then the Ostrich begins all over again. He may go through this performance three or even four times in succession. The performance seems to cost him considerable exertion. It is probably both a love note to the hen and a challenge to rival males. At a short distance the call resembles the roar of the lion a mile or more away. I never heard them make the "cackling sound" mentioned by some writers.

The Rhea has a peculiar call or cry, but it is given only at rare intervals. It sounds much like the syllables "wah-hoo," with the first slightly prolonged, and the second considerably so. It is given in a deep bass tone. They make a hissing noise when angry, as do also the Cassowaries. The latter have, too, a sort of clucking note. I do not remember ever to have heard an Emu make any kind of vocal sound except a sort of low grunting, rumbling noise, made deep in the throat, and somewhat similar to the boom of the Ostrich.

I often observed the two male Rheas, in the paddocks together, stand facing each other at a short distance, spreading and fluttering the wings in a love-making scene. The Ostriches, both male and female, would frequently spread and flutter the wings, at the same time rocking the whole body from side to side, in an attempt at love-making. Sometimes they would do this standing, sometimes "kneeling," with the tarsi protruding straight out in front. The smaller of my male South Africans would frequently go through this performance when I came near him, always kneeling before me. He was a bird of good disposition.

Since no two of our struthious birds, with the exception of the Rheas, could be kept together, the eggs were not fertile. Only one of our birds laid with any regularity while I was in the Ostrich

House. This was the South African. Beginning about the first of May she averaged two eggs a week during the summer. For six or eight hours before laying, she would appear listless and would take no food. The presence of the egg was indicated by a great swelling near the vent. She usually dropped her eggs in the inside cage; only once did she drop one on the ground of the paddock. In an hour after laying she would be eating and in as lively spirits as usual. She was good natured and offered no objection to my taking her eggs. I usually went to the door of the cage and drew the egg out with a garden rake. One evening, however, forgetting my caution, I went into the cage to get the egg. This disturbed the bird and in stepping around, she kicked the egg with sufficient force to roll it over against the cement "footboard" and crack the shell. Superintendent Brown said I might take it home and cook it, which I did. When boiled I found the yolk smaller in proportion to the bulk of the "white" than in the common hen's egg, but the flavor was much the same. Since one Ostrich egg is equal to about two dozen hen's eggs, my wife and I breakfasted off Ostrich egg for a week.

The eggs of the two species differ considerably, that of the South African being a rich cream color, deeply pitted, and oval in shape, while that of the Somali Ostrich is white, almost smooth, and almost round, being very little greater in one diameter than in the other. The period of incubation is from forty-two to forty-five days. The hen sits on the eggs during the hours of daylight and the male at night, hence the gray of the female, harmonizing with the color of the prevailing sand of the native habitat, and the black and white of the male, inconspicuous in the darkness.

As both our Rheas were males, we had no eggs. Both our Emus were males, but we had an egg in the Ostrich House from a hen formerly kept in the Garden. It is a very dark green, verging on blue. The egg of the Cassowary is a very light tea green.

The African Ostrich does not reach full size until he is three or four years old, but his first feathers may be ready for plucking as early as the tender age of nine months. After that he yields a harvest of plumes about once in every eight months. The most valuable feathers come from the wing of the male. These are long, broad, snowy white, and twenty-four in number from each

wing. These are the primaries. The secondaries are much smaller, a dull black or even gray in color, and of course much less valuable. The tail feathers of the male are second in size and value. They are a beautiful jet or glossy black. They are almost as fine and beautiful as the primaries. The gray wing and tail plumes of the female, while smaller than those of the male, are still very beautiful. The black and white wing coverts of the male and the gray wing coverts of the female, are very soft and pretty, and are much in demand when made into boas, fans, and other ornamental articles.

The long quills of the Rhea are not without beauty and are used extensively in the manufacture of dusters. The feathers of the Emu and Cassowary are of interest to the naturalist from the great development of the aftershaft, this being equal in every way to the shaft, making the structure appear as two feathers on one quill. These double shafted feathers are also in considerable demand by milliners. While I was at the Garden a milliner told me that many of the apparent Lesser Bird of Paradise plumes are Emu feathers dyed.

Of all my struthious birds, the Rheas were the best natured. They were always ready to go out of the cage as soon as the doors were opened in the morning, eager to come in to eat, and easily driven in at night. I could go among them in the cage or paddock as among domestic fowls. Only once did they cause me any trouble. One Sunday evening they objected to going indoors at closing time. The weather was too fine and the hour too early to retire, in their estimation. They led me a merry chase all over the yard and did considerable hissing, and I had to get the rake to drive them into the house. The experience was rather humiliating. My wife was at the Garden and I had just been bragging to her what good birds my Rheas were.

The African Ostriches were generally fairly good-natured. The young Somali birds received from California would gather about me at feeding time like barnyard fowls. My wife went in the paddock one Sunday evening with me and they wanted to eat the flowers off her hat. My larger male South African, however, was mean and irritable. I could not enter the cage with him without first attracting his attention elsewhere. I would usually throw

him about three-fourths of a pound loaf of bread, stale and hard, too big for him to swallow whole, but of such a size that he thought he could swallow it, and while he was working with the bread I would enter the cage and clean it. But if I touched his toes with the rake or shovel, he would bristle up like a turkey cock. Frequently he would walk up and down the fence trying to get at the sightseers.

The Emus never offered any objection to my entering the cages with them. The Cassowary is essentially a bird of the thick forest rather than of the plains and can not bear the glaring light and heat of midsummer which is the delight of the Ostrich. He seeks the shade with mouth open and tongue protruding. The Australian Cassowary never attacked me in the cage, but one morning, as I was reaching between the bars to unfasten the door, he charged with a vicious hiss, kicking at me with great force. Fortunately for my hand and wrist his aim was poor and he only grazed the member. He is a much better-natured bird than the Papuan and this is shown in his more noble posture and carriage. He goes about with his head in the air, looking the world in the face, while his cousin from New Guinea sneaks around with his head low and his eyes on the ground, like the evil creature he is.

My male Papuan Cassowary was the most irreligious bird I ever knew. He had a diabolical disposition. He was always ready for a fight and would never permit me to enter the cage with him. When I opened the doors in the morning, all the other birds were eager to get out, but the male Papuan could not be persuaded to leave the inside cage as long as I was watching him. I would open his door, then go to the other side of the house and busy myself cleaning cages. In half an hour or so I would slip back on tiptoe to see if he had forgotten himself and gone out. I generally had to make several such stealthy reconnaissances before I caught him unawares. If he heard me coming, even if he were at the furthermost corner of the paddock, he would start back at full speed, and just hump himself to get inside before I could close the door. He and I had many a kicking match. One morning the door stuck and he thought it was a good time to get that keeper. He came at me like a whirlwind, but he kicked just a little too soon and his foot merely touched my stomach.

This gave me an opportunity and I planted my shoe with full force in his gizzard. He responded with a grunt. Thinking discretion the better part of valor, he went on into the cage. I did not always fare so fortunately, however, for once he kicked me in the side till I was lame for a week.

The kick of all the Ostrich-like birds is forwards and downwards. They can not kick backwards, but can kick considerably to one side of straight-forward. I have seen the Emu kick at an angle of at least forty-five degrees from the straight-forward direction. I never knew one of these birds to jump on an antagonist when down. It seems they can strike a telling blow only at a height of two or three feet from the ground. I was always told to lie down if attacked.

The only act I ever observed in any of these birds that had the least resemblance to intelligence was shown by my big South African. He seemed, at least, to work a scheme to get a piece of bread. I have already spoken of his mean disposition and how I was in the habit of throwing him a big piece of bread with which to amuse himself while I cleaned his cage. He was always hungry and not only ate all I gave him, but usually cleaned up what the other Ostriches left in their boxes. Several times toward the end of my stay in the Garden, when I was ready to clean his cage and opened the doors, he lingered inside and refused to go out. So I would get a piece of bread, break it into small pieces, and throw them into the paddock. He would rush out eagerly to get the bread. After a time his staying in the cage became a settled habit. No matter how long I waited, he would not go out till I went for the bread. When he saw me come from the feed room, he would immediately run out of his cage, even before I had time to get out of the house and throw him the bread. However, there may not have been as much design in this as was apparent.

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GROUP VARIATION AND BIRD-SONG.[1]

BY FRANCIS H. ALLEN.

MR. CHAUNCEY J. HAWKINS in his paper in 'The Auk' for January, 1922, makes the interesting suggestion that bird-song has been evolved by a process of group variation, i. e., simultaneous variation in one direction by a number of individuals. He points out difficulties in the way of an acceptance of the sexual selection theory. The difficulties are certainly there. It *is* hard to see why individual variations should not be swamped in transmission from one generation to the next. Doubtless only those variations which inhere in the chromosomes could be thus transmitted. But is there any good reason why such heritable variations, or "mutations," should not be acted upon by sexual selection as well as by natural selection? The argument, also, that, if sexual selection were operative, each pair of birds, provided they possessed any individuality either in song or in plumage, would be a starting point for a new group of individuals and shortly a new species would be formed, so that eventually nothing would be left of the original species—this argument seems not unanswerable. It might with equal force be used against the group variation theory, unless the group to vary were co-extensive with the species itself. It leaves out of consideration various factors that tend to conservatism, such as natural selection and the herd instinct. As a matter of fact, there is local variation in the songs of many, if not all, species of birds, but this, in my opinion, is due not so much to sexual selection as to another factor.

But let us examine this new theory of group variation and see if it be tenable. Mr. Hawkins quotes the following as from T. H. Morgan's 'Evolution and Adaptation': "If a number of new forms appeared at the same time and left a number of descendants, then the probability that the new group might perpetuate itself is greater, and the chance that such a group would arise is in proportion to the number of individuals that vary in the same direction simultaneously. In this case the new species has not come from a single individual or even from a pair of indi-

[1] Read, in an earlier and much shorter form, before the Nuttall Ornithological Club.

viduals, but from a number of individuals that have varied more or less in the same direction."

Certainly, the conclusion follows naturally on the hypothesis. But how often does this happen? And through what process does it happen? The many subspecies of Fox Sparrows and Song Sparrows in the West may have originated in some such way through the direct action of climate on the chromosomes, though through just what mechanism this would come about is not clear. It may even be that *Melospiza melodia* and *M. georgiana*, species inhabiting, roughly speaking, the same range though quite different local habitats, became differentiated in the same way, though this presents even greater difficulties. But it is the application of this theory of group variation to the songs of birds that I especially wish to call in question, for Mr. Hawkins thinks he finds in it the solution of the problem of the evolution of song. He holds that the impulse to excel itself urges the bird on to better and better expression in song. "Singing at its best," he says; "the 'craziness' of the bird compels it to sing a better song. This is not only true of the individual; it is true of every individual of a species or a subspecies. Thus the improvement . . . is not made in one bird but in a group of birds." But why, I ask, should the improvement all go in the same direction? What directs it? And again, what, to the bird, *is* improvement? Is it more noise merely? Evidently not. But why, under Mr. Hawkins's theory, should it not all be no more than mere noise? What has turned it into music? Excitement, "craziness," of itself does not produce beauty. It may induce an exaggerated self-expression, but there must be some appreciation of the beautiful to turn that self-expression into a pleasing form. And if beauty of tone and melody pleases the male bird when he utters his song, shall we deny an equal appreciation of it to the female? And if the female appreciates the beauty of the male's song, why should she not discriminate between the songs she hears and succumb most readily to the ardor of the finest singer? Can the poor or indifferent singer so easily break down the reluctance, overcome the coyness, of the female? Will he not fail more often than the better singer, and perhaps go unmated? It is not necessary to assume the existence of any conscious rivalry

on the part of the males or any conscious choice on the part of the female. Have those who do not believe in sexual selection given due consideration to this aspect of the case? Mr. Hawkins, in his paper in 'The Auk' for October, 1918,[1] dismisses it with a few words: "If the purpose of song is excitation of the female to break down her coyness, this very act may compel her to exercise an unconscious choice and thus sexual selection may exert a limiting and directive force in the life of the bird." Groos, however, whom he cites on this matter of overcoming the coyness of the female, attaches much more importance to the rôle of sexual selection, as also does C. Lloyd Morgan, who says: "It can scarcely be doubted that such antics, performed in presence of the female and suggested at sight of her, serve to excite in the mate sexual appetence. If so, it can, further, scarcely be doubted that there are degrees of such excitement, that certain antics excite sexual appetence in the female less fully or less rapidly than others; yet others, perhaps, not at all. If so, again, it can hardly be questioned that those antics which excite most fully or most rapidly sexual appetence in the female will be perpetuated through the selection of the male which performs them."

Now let me call attention to the fact that the variations called for in this matter of bird-song are not morphological but psychological, or at least chiefly so, and that, moreover, they concern not only capabilities and degrees but manifestations. For song, like speech, is a manifestation, or expression, of the psychology of the individual that uses it. It is a *psychological* manifestation, and while every psychological process has a physical basis and is subject to the laws of cause and effect, it is easy to see that the possibilities of variation are almost infinitely wider than they could be in the field of morphology. One has only to consider the infinite range of the human mind and the vast differences between the thoughts and speech of various races and conditions of mankind and compare them with the homogeneity of human bodies all over the world. It is said that there has been little, if any, actual progress in intelligence among mankind during the historical period, and human psychology in that sense has made a minimum of advance, but the *manifestations* of human intelligence

[1] Auk, XXXV, 421–437.

have, by the process of *social* evolution, made tremendous advances. These advances have infinite possibilities, and, aside wholly from any advance or progress, the varieties of expression of human thoughts are infinite. Think of the vast number of languages that man has developed, the vast number of words in those languages, and the vast—the infinite—number of combinations of those words, fitted to convey all sorts of communications. Think, too, of the possibilities of combinations of tones into what we call music. Those combinations, also, are infinite in number. And those combinations, so far as melody is concerned, are open to the birds.

Now, what is the chance of two or three or more birds hitting independently upon the same combination of notes and then mating and passing this particular combination down to the next generation? For it is not merely the capability of producing these combinations that Mr. Hawkins believes can thus be transmitted but the actual combinations themselves. Is it not simpler to assume that nature availed herself of the originality and inventiveness that birds undoubtedly possess in common with the other higher animals, together with the imitativeness which is also universal in the higher groups, to accomplish the development of song through *social*, instead of biological, evolution?

Is it not sound scientific reasoning to attribute the evolution of bird-song to factors which, like invention and imitation, are well known to exist in nature rather than to set up a new hypothesis like this of group variation which may be difficult if not impossible of proof?

Mr. Hawkins seems to have overlooked this one important item in my enumeration of the probable factors in the development of bird-song—invention on the part of the singer. At least he directs his argument against imitation as if that were held to be the only aid to sexual selection in the development of song. It is *invention* and imitation that, in my view, account for the forms of the songs, every singer being a potential inventor of new notes and phrases as well as an imitator of the songs of other birds *of the same species*. Growth in the song of a species comes by each improvement being initiated by some inventive individual and then adopted in turn by that bird's offspring or neighbors.

I have said that birds are both inventive and imitative animals. Will that statement be questioned? Not so far as imitativeness is concerned, I am sure. We are all familiar with examples of this instinct. As to inventiveness, some who place emphasis on the automatic character of bird-behavior may be more doubtful. But, reduced to its simplest terms, invention is merely an exercise of the individual will. Every bird's life is, as I conceive it, largely made up of original acts, acts of the will. When a migrating bird alights in one particular apple tree in your orchard, he has made a choice of that tree among the others. It is no mere tropism that has drawn him to it, nor is it pure chance. His choice may be capricious and without much deliberation, but it is none the less a choice, a carrying-out of the bird's will. So, when a bird utters a call-note or a song, he makes the choice at that moment between utterance and silence. We cannot question that, I think. And when he sings, if he is not a mere automaton, he *may* exercise some originality in the matter and the manner of his song. Of course, he is restricted by habit, by herd instinct, by the capacities of his vocal organs and of his psychology, and only the exceptional bird departs appreciably from the normal song of the species, but every bird is potentially an inventor in the matter of song, exercising his own will in this as in others of his activities.

Many species of birds have two or more distinct songs. Some of these songs are characteristic of certain seasons, but in many cases the bird changes from one song to another in what is evidently a purely arbitrary fashion, such as no mere automaton would be at all likely to follow.

Even in the matter of imitation we find a certain amount of willing, of inventiveness. The Mockingbird, for instance, is no mere phonograph or echo. He exercises a choice and *selects* the new notes that he adds to his vocabulary. It is not simply the last bird-note he hears that he repeats. Indeed, he makes each addition to his repertoire his own, and may retain it long after the bird he imitates has left the neighborhood. And he has no hard and fast programme of imitations, but varies the order and intersperses them among his own Mockingbird phrases *ad libitum*.

Mr. Richard Hunt, in his suggestive paper on "Musical 'Taste' in the Brown Towhee" (Condor, November, 1922) lays the emphasis on imitation as opposed to invention, but the imitation he writes of is really a selective imitation which, so far as the singer is concerned, virtually amounts to invention, for it is not the mechanical repetition of what the singer has heard but the adoption of the new notes as a part of its own vocabulary and their deliberate addition to its previously acquired song. It is, of course, only the really inventive individuals that use this sort of imitation. The average bird keeps on in the well-worn path of the species, imitating its own kind and exercising that conservative influence which is so necessary in bird life as in human life.

It is important, of course, to bear in mind the distinction between individuality and originality in the sense of inventiveness. We cannot assume that all individual variation in bird-song is due to invention on the part of the singer. Some of it may be congenital or acquired by imitation of another aberrant singer, but such a case as that of the European Blackbird, narrated by Mr. Charles A. Witchell, seems clearly to point to invention. "What seemed an interesting example of progressive variation in the song of a Blackbird," says Mr. Witchell, "occurred directly under my notice. In 1888 a pair of Blackbirds reared their brood in a nest only a few feet distant from the window of the dining-room at my residence; and the young ones must have heard, for an hour or two every day, the notes of a piano, and sometimes those of other instruments, played in the room. Early in 1889 a Blackbird in the garden (the only male, and a bird born in the previous year) sang little more than the following notes, which he would repeat dozens of times at short intervals: [here a bar of music] . . . As spring advanced the bird acquired a few other notes, always uttered after the others, but the same phrase was still the main theme. Next year it constituted about one-half of the songs of the old Blackbird in our garden; and in 1891 it was often repeated, also in 1892. In 1893 I heard the same phrase sung three times in succession by an old Blackbird in the garden. Blackbirds are with us throughout the year, and always roost in the same spots, which circumstances give occasion for the surmise that the same singer was with us throughout four years,

and elaborated his notes from one kind of song to many others."[1] The same writer gives a similar instance of a House Sparrow: "Early in July, a male House Sparrow, which apparently lived near my bedroom, acquired a new note: it was seemingly a shout, and resembled the very rapid upwardly-slurred whistle, sounding like the word 'twit,' so frequently uttered in early spring by the male Chaffinch. The Sparrow repeated this cry every morning with the greatest persistence, and his manner of looking about during the performance indicated some pride in it. After ten days or so had elapsed he seemed to tire of the cry, and he gradually abandoned it. I never heard another House Sparrow utter this note."[2]

I had not supposed that it would be necessary to prove the existence of inventiveness among birds, and perhaps all this may be a work of supererogation, but as Mr. Hawkins has overlooked this phase of the subject, I have ventured to give these few instances.[3] The imitative instinct being also granted, we have these two factors of invention and imitation acting through social, not biological, evolution to produce the variety and fix the forms and characters of bird-songs. Back of them is the song-impulse derived from the hormones which are secreted by the male sex glands; and working with them, as I believe, is sexual selection, "evolving, through both structural and psychological changes, beauty of tone and proficiency in execution."

West Roxbury, Mass.

SOME NOTES ON THE BIRDS OF THE BRANCHPORT, N. Y., REGION IN 1922.

BY VERDI BURTCH.

Sterna caspia imperator. CASPIAN TERN.—This Tern can now be safely called a regular spring visitant on Lake Kenka at Branchport. It was first seen this year, May 1, when one appeared flying over the street with a lot of screaming Ring-billed and Herring Gulls. May 6, one

[1] 'The Evolution of Bird-Song,' London, 1896, pp. 148, 149.

[2] *Op. cit.*, p. 153.

[3] On the subject of "perceptual volition" in animals see C. Lloyd Morgan 'Animal Life and Intelligence,' pp. 458–463.

was seen and May 7 there were two with fourteen Common Terns flying around over "the basin." May 14, there were five over the lake. June 25, I heard the peculiar rasping cry of this Tern and saw two of them over the lake. Mr. C. F. Stone saw two Caspians July 21.

Sterna hirundo. COMMON TERN.—This Tern is now a regular spring visitor here and was first seen this year on May 7, when there were fourteen coursing over "the basin." After this they were seen daily, increasing in numbers to twenty, seen May 11. On this date I noticed two Terns at close range on the piles of an old boat dock. One of them was a typical Common Tern, the other appeared slightly larger, lighter colored and the bill was all red to the tip. I feel sure that this bird was an Arctic Tern but never having seen one before I cannot record it with certainty. After May 11, they diminished in number and were last seen May 21 (two only). July 21, two Common Terns were seen several times during the day.

Chlidonias nigra surinamensis. BLACK TERN.—The Black Tern is now a regular spring and late summer visitant here. The dates they were seen this year were: May 6, one; May 10, three came up the lake in the morning; May 12, two seen; May 21, one sat on an old snag at the edge of the marsh for a long time. Aug. 4, three seen, one was still in the black plumage, the other two were slaty with white on the head and neck. Aug. 20, three seen (one black).

Mareca penelope. EUROPEAN WIDGEON.—Mar. 7, I saw a mated pair of European Widgeons standing on the ice at the edge of "the Channel." In the distance I thought that they were Baldpates but as I approached them I could plainly see the cinnamon-red head and neck of the male and the lighter head and neck of the female. When they arose they flew towards me and the cream buff crowns of both birds were very conspicuous.

Aix sponsa. WOOD DUCK.—In the early 1900's the Wood Duck was fairly common in Potter Swamp, Yates Co., N. Y., and I found two or three nests nearly every spring. Then lumbering operations in the swamp took much of the large timber and this beautiful Duck has become rather rare. I was in the swamp many times in May and June this year but did not see even one and had about concluded that none had nested there this year.

Oct. 1, Mr. Henry Southerland and I visited the north end of Potter Swamp where we took an old boat and went up the creek. We had gone but a short distance when we found a dead female Wood Duck floating on the water. We had noticed several empty gun shells floating on the water and when I skinned the specimen I found several shot holes in the body.

There is no open season on the Wood Duck in New York State, nevertheless I believe that many are shot in Potter Swamp every autumn.

Charitonetta albeola. BUFFLEHEAD.—Apr. 6, a female Bufflehead was brought to me that had been caught on a set line that had been set for

bullheads. The hook had been baited with angle worms. When found the Bufflehead was hooked through the lower mandible and was struggling hard to keep its head above the water. I put a band (No. 43985) on its leg and let it go. This band was returned to the U. S. Biological Survey by Ralph White of Collingwood, Ontario, who stated that he had removed it from the leg of a duck that was caught in a herring net in the Georgian bay about Apr. 15.

Clangula hyemalis. OLD-SQUAW.—Apr. 13, I noted a lone female Old-squaw diving in "the basin" and as she appeared to stay under water longer than the average duck I began to time her, taking first time just as she came up. She was up 7 seconds then down 35 seconds, up 5 seconds, down 35 seconds, this time coming up way inshore and she swam out before diving again. After the first time down she was up 5 seconds, down 35 seconds, up 5 seconds, down 45 seconds, up 5 seconds, down 45 seconds, up 10 seconds when I left off timing and watched her movements through 8-power binoculars. At the beginning of every dive she raised her wings from her side and went under the water with them raised slightly above her back. It was done very quickly but I watched closely and many times and am absolutely sure that the wings were raised before each dive.

Erismatura jamaicensis. RUDDY DUCK.—Noted a pair in "the basin" every day from Mar. 21 to Mar. 26.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.—The Evening Grosbeak is now a regular visitant here, appearing at least once a year, usually in the spring (March to the middle of May). This year a single bird was noted Mar. 1, and Mar. 5 a lone female was feeding on the maple seeds in the street nearly all day. Mar. 8, a female was feeding on the fruit of a black thorn in my back yard. May 3, saw a pair, in a spruce in a neighbor's yard.

Passerherbulus nelsoni nelsoni. NELSON'S SPARROW.—Oct. 9, I was tramping around in the marsh when a Nelson's Sparrow flew up and lit in some cat-tails just ahead of me. I had an unobstructed view of it for several seconds and noted the well defined white stripes down the back, the dark brown median stripe and the deep buff sides and neck.

Melospiza lincolni lincolni. LINCOLN'S SPARROW.—During my bird banding in connection with the Biological Survey, I caught several Lincoln's Sparrows. The trap was set in the edge of a young orchard where the grass was uncut and it was about 15 feet from a tangle of choke-cherry, elm saplings and woodbine. Aug. 9, two were caught and banded, Nos. 17915 and 17916. Aug. 10, one banded, No. 17919. Aug. 12, one banded, No. 17922. Aug. 20, No. 17916 was taken again and a new one banded, No 17924. Aug. 21, No. 17924 was taken again and two more were caught (one a very small bird). I was out of bands so could not band these. I was rather surprised to get these birds so early in the season as I am not aware that the Lincoln's Sparrow nests in this locality. I found them nesting in a sphagnum and tamarac bog in the Adirondacks near Old Forge

in June, 1920. I know of no such country around this region but of course they may nest in an altogether different environment here.

Dendroica palmarum palmarum. PALM WARBLER.—April 23, as I was crossing a piece of wet ground, a Palm Warbler flew up from in front of me to a low branch of a willow where it sat bowing for a moment, then went into a thick bunch of pussy willows and was not seen again. This is my first record for Palm Warbler at Branchport.

Thryothorus l. ludovicianus. CAROLINA WREN.—May 21, about 6:30 A.M., a friend came to me and told me that there was a strange bird singing in a back lot up the street, so I hurried back with him and soon was listening to a bird-song that I had never heard before. We soon located the singer in the top of a small cherry tree and knew at once that it was a Carolina Wren. It must have been around this same place for at least a week as the people who lived there had been telling me of hearing a strange bird; I was busy at the time and did not look it up. It was around until the 24th and I heard it every day singing from the top of a big willow near the street, I am sorry that I did not take time to look for its mate as I feel sure that it had one and that they were nest building. Perhaps a cat caught one of them and the other left the locality.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—From my house to and through the marsh to the lake is a well-worn path which I travel two or three times a day during the fall migrations. Oct. 10, about 9 A.M., when I was traversing the path a very small bird flew up and lit again into a patch of very thick grass (*Calamagrostis canadensis*). Immediately it climbed up on top of the grass and scolded and it was so close that I easily identified it as a Short-billed Marsh Wren. It scolded and played around within six feet of me for several minutes, then disappeared. At 1:30 P.M. I went down to the marsh again and found the Wren farther down the path. I first heard it scold, then it came out in the open on top of the broken-down grass, made little clicking notes and sang a very soft sweet song. It was so close and in the open that I wished for my camera and went to the house after it. But when I got back it had moved farther on into the cat-tails. A pair of Long-billed Marsh Wrens came out and sang and "did stunts," I "squeaked" and the Short-billed came out where I had a fine chance to compare it with the Long-billed and note its smaller size, the streaked crown and lighter, grayer look, then it dropped down in the grass and I could trace its movements by seeing the grass tremble. It came along towards me in the thin grass, coming within 18 inches of my feet and looked up at me. It was there at my feet about a minute, then worked up into the grass and weeds and away. Oct. 11, I did not see it until I was leaving the marsh when it flew up from the path and lit in a pile of posts where it sang and played peek-a-boo with me but I could not call it out into the open. Next day I was unable to flush it at all and it was not seen or heard again.

Branchport, N. Y.

NOTES ON THE BREEDING BIRDS OF CLARK'S FORK, BONNER COUNTY, IDAHO.

BY THOS. D. BURLEIGH.

THESE notes were taken during the summer of 1917, while I was temporarily attached to the U. S. Forest Service as a Lookout. To the uninitiated it might be well to explain that such a position carries with it the opportunity of spending the summer months in an, ordinarily, 8 by 12 cabin perched on the top of the highest peak where constant watchfulness is kept over the surrounding country for forest fires. My official residence happened to be the Trestle Creek Lookout Station, situated on a mountain top at an elevation of a little over 7000 feet, and some forty miles north of Clark's Fork, and it was here that, with the exception of an infrequent trip to the valleys below me, I spent the time from July 5 to Sept. 14. Several days spent at Clark's Fork early in July and again in September, and my trip to and from the lookout station, with short trips to the valleys, when the day was hazy or unexpected rain had fallen, were my only opportunities for observing bird life other than that found well up the mountain sides. Nevertheless I made the most of this little time spent away from my actual job and I acquired a fair knowledge of the distribution of bird life in this part of the country.

Clark's Fork lies in the extreme northwestern part of the state, in the so-called Panhandle, and within a short distance of the Canadian line. The surrounding country is strictly mountainous and heavily wooded, and forms the present Pend d' Oreille National Forest. The valleys are to a large extent narrow and rugged, one exception being that in which the town is found. As a result little farming is carried on and except where logging operations have been conducted the timber is largely untouched. Small streams are of course numerous, and the Pend d' Oreille River, flowing approximately east and west at this point, brushes the edge of the town and empties some ten miles distant into Lake Pend d' Oreille. The elevation of the valleys is about 3000 feet and the mountain tops average from 6000 to a little more than 7000 feet, although one peak within view of the lookout station was unquestionably well over 10,000 feet.

This region is famed for its unrivaled stands of western white pine (*Pinus monticola*) and I soon found this to be the predominating tree in the valleys. Along the streams, however, are found the western red cedar (*Thuja plicata*), the western hemlock (*Tsuga heterophylla*) and the western larch (*Larix occidentalis*), and to a less extent the Douglas fir (*Pseudotsuga taxifolia*). Many of the streams are bordered by deciduous underbrush, willows and alders, but it is only in the more open country that these form more than a mere fringe. Well up the mountain sides, especially on the north slopes, the Englemann spruce (*Picea Englemannii*) appears, to be replaced, as timber line is approached, by the alpine fir (*Abies lasiocarpa*). Timber line is reached at approximately 7000 feet, the mountain tops above that elevation being covered with either steep talus slopes or grass. The fir woods were open and largely free from underbrush, the trees being scattered singly or in small groups. Here, on the north slopes, snow drifts lingered almost the entire summer and as far as I could see formed the source of many of the small streams that were found in the ravines farther down the mountain sides. These ravines, narrow, rugged and heavily wooded, and invariably with swift roaring streams where they reached the valleys, widened out as they reached a higher altitude to form the open meadows so characteristic of the higher ridges. The meadows covered from one to three acres and were really open grassy parks with little underbrush and groups of firs scattered about here and there.

The lookout station was well situated as far as varied topography and local conditions were concerned, for when opportunity offered it was possible within a short time to be in widely different situations. On one side of me was Lightning Creek, and here there were virgin stands of white pine, cool secluded ravines, and practically no open country whatsoever, while on the other side was Trestle Creek where logging operations had but recently been carried on and the valley, as a result, largely an open slashing.

Bird life, I soon found, varied widely in different spots, the life zones being quite distinct.

About Clark's Fork, an open valley where the land was largely under cultivation, the following birds were seen, and recorded nowhere else:

Spotted Sandpiper
Killdeer
Kingbird
Western Wood Pewee
Western Crow
Bobolink
Cowbird
Western Meadowlark
Brewer's Blackbird
Western Vesper Sparrow
Western Savannah Sparrow
Black-headed Grosbeak
Lazuli Bunting
Cliff Swallow
Tree Swallow
Rough-winged Swallow
Cedar Waxwing
Red-eyed Vireo
Yellow Warbler
Macgillivray's Warbler
Western Yellow-throat
Long-tailed Chat
Redstart
Catbird
Western House Wren

In the heavy timber such as was found on Lightning Creek bird life was much scarcer and totally different from that in the open valleys, the following species being characteristic of such country, and seen nowhere else:

Batchelder's Woodpecker
Hammond's Flycatcher
Western Tanager
Townsend's Warbler
Dipper
Western Winter Wren
Chestnut-backed Chickadee
Western Golden-crowned Kinglet
Olive-backed Thrush
Northern Varied Thrush

Well up the mountain sides another distinct change was noted, the open fir woods and meadows having birds, in many cases present in large numbers, that were entirely lacking in the valleys. Among these were the:

Franklin's Grouse
Red-naped Sapsucker
Olive-sided Flycatcher
Dusky Horned Lark
Clarke's Nutcracker
Rocky Mountain Pine Grosbeak
Cassin's Purple Finch
Crossbill
Gambel's Sparrow
Lincoln's Sparrow
Slate-colored Fox Sparrow
Orange-crowned Warbler
Audubon's Warbler
Pileolated Warbler
Pipit
Red-breasted Nuthatch
Mountain Chickadee
Ruby-crowned Kinglet
Townsend's Solitaire
Audubon's Hermit Thrush

Some few species were found wherever any open country occurred, either in the valleys or up the mountain sides to the edge of timber line, the heavy timber alone being shunned. Characteristic of this disregard of altitude were the:

Rocky Mountain Hairy Woodpecker
Red-shafted Flicker
Pine Siskin
Western Chipping Sparrow

Calliope Hummingbird	Montana Junco
Rocky Mountain Jay	Mountain Bluebird

It is realized that this list is far from complete but so little has appeared to date concerning the bird life of Idaho that it was felt that there was justification in publishing the results of this summer spent in Bonner County. The notes that follow are largely a summary of the relative abundance and distribution of the species noted, with a few late breeding records.

Actitis macularia. SPOTTED SANDPIPER.—This species was found to be a fairly plentiful summer resident here, in the more settled country about Clark's Fork. Birds were seen both along the Pend d' Oreille River and about the occasional small streams and scattered ponds.

Oxyechus vociferus. KILLDEER.—Like the last, fairly plentiful and found in open fields or pastures in the vicinity of water.

Canachites franklini. FRANKLIN'S GROUSE.—I found this bird nowhere but in the open timber on the higher ridges, but here it was reasonably plentiful and seen at frequent intervals. Locally it is known as "Fool Hen" and I was not long in admitting the appropriateness of this title. On approaching a bird it would fly to a lower limb of the nearest tree and remain there calmly watching me as I stood beneath it, often, as it happened, not over fifteen feet away. On Aug. 14 a female was found with two half grown young, feeding at the edge of an open mountain meadow. On my approach the old bird walked out to the end of a large log where she allowed me to walk within five feet of her before flying into a large fir nearby. The young ran for a short distance and then crouched close to the ground where they remained until I almost touched them. Then they too flew into the nearest tree. Five birds seen Sept. 8 were feeding on huckleberries in an open space on the mountain side, and I succeeded in walking within a few feet of them before they resented my curiosity, and flew.

Accipiter velox. SHARP-SHINNED HAWK.—On one of my infrequent trips to Trestle Creek one of these birds was noted flying by overhead, and later, Aug. 25, one was seen perched in the top of a large dead fir at the top of the mountain. Possibly this is not an uncommon breeding bird here.

Buteo borealis calurus. WESTERN RED-TAIL.—A pair of these birds had seemingly nested in the open timber near the Lookout Station and one or two were in evidence daily throughout the summer.

Cerchneis sparveria phalaena. DESERT SPARROW HAWK.—Scarce, and seen but twice during the summer, a single bird July 20 and three on Aug. 23, hovering each time over a large talus slope at the top of the mountain.

Asio flammeus. SHORT-EARED OWL.—My one record for the occurrence of this species here was rather unexpected. On Aug. 15, just at

dusk, a large bird lit in the top of an old dead snag standing near my cabin and on being shot proved to be a Short-eared Owl. Considering the fact that this was at the top of one of the higher peaks and that for a radius of possibly forty miles the country was heavily timbered, my surprise at securing this bird can easily be realized.

Bubo virginianus pallescens. WESTERN HORNED OWL.—On Sept. 11, while at the Trestle Creek Ranger Station, one bird was heard late in the afternoon calling frequently from a thick stand of hemlocks and red cedars that bordered the stream at this spot.

Ceryle alcyon alcyon. BELTED KINGFISHER.—My one record for the occurrence of this species was a single bird seen Sept. 4 flying by low overhead over the top of the mountain.

Dryobates villosus monticola. ROCKY MOUNTAIN HAIRY WOODPECKER.—Fairly plentiful, and seen both in the open valley about Clark's Fork and on the higher ridges near the Lookout Station. On the western slope below my cabin the timber had been killed several years ago by a fire and here one or two birds could be seen daily feeding in these dead fire-scarred firs.

Dryobates pubescens homorus. BATCHELDER'S WOODPECKER.—I saw this species only in Lightning Creek, and here on July 8 a nest was found that held almost fully fledged young. It was fifteen feet from the ground in the stub of a small white pine in open woods within fifty yards of the stream. Both adults and young were very noisy, the latter keeping up an almost incessant call for food. Later, on Sept. 2, three birds were seen well up the mountain side, one of them, a young bird, very probably from this nest, still following the adult birds about and being fed at frequent intervals.

Sphyrapicus varius nuchalis. RED-NAPED SAPSUCKER.—The first bird was seen July 29, while crossing one of the open mountain meadows, and they later were found to be fairly plentiful in such spots. Two birds seen Aug. 23 were flycatching quite efficiently, darting out at frequent intervals from the upper branches of a large dead tree after passing insects.

Phloeotomus pileatus abieticola.—NORTHERN PILEATED WOODPECKER.—This species was far scarcer than I expected to find it, for I have but one record for its occurrence here, two birds being seen Sept. 14 in the open woods at the edge of the town. None were seen in the heavy timber either on Lightning Creek or Trestle Creek.

Colaptes cafer collaris. RED-SHAFTED FLICKER.—A common bird wherever any open country occurred. In common with other species they wandered to the tops of the higher mountains, practically at the edge of timber line, during late summer and could be found then in large numbers on the open slopes. Sixteen birds that I found feeding together at one spot on Aug. 6 is an indication of how they deserted the valleys at this time of the year.

Chordeiles virginianus hesperis. PACIFIC NIGHTHAWK.—Early in the evening of July 3 three birds were seen feeding high overhead over

the town, and the following day a bird was seen asleep on the top of a low stub in the middle of an open field. In all probability this species is a reasonably common summer resident here.

Chaetura vauxi. VAUX'S SWIFT.—A common breeding bird here. I usually saw them during my infrequent trips to the ranger stations on Lightning Creek or Trestle Creek, although at intervals single birds or small scattered flocks would appear feeding about my lookout station. My last day on Trestle Creek, Sept. 11, three were seen feeding low overhead.

Selasphorus rufus. RUFOUS HUMMINGBIRD.—I have but one record for the occurrence of this species here, one bird, a male, being seen July 4 resting quietly on a dead twig at the edge of underbrush bordering an open field.

Stellula calliope. CALLIOPE HUMMINGBIRD.—I found this species plentiful wherever I went, in the more open woods about the town, in the heavy timber in the valleys, and in the mountain meadows and stretches of alpine firs at timberline. A nest found July 4, in a short stretch of woods at the edge of the town, was thirty feet from the ground at the outer end of a dead drooping limb of a large Douglas fir, and held two almost fully fledged young. My latest record is a bird seen Aug. 29, feeding about some flowers at the side of a stream in a deep wooded cañon.

Tyrannus tyrannus. KINGBIRD.—A fairly plentiful summer resident in the open country about Clark's Fork.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—I saw this species nowhere but in the mountain meadows scattered at the edge of timberline but in spots such as this one or two pairs could invariably be found. The heavy timber in the valleys held no attraction for them although the slashings which follow logging will sooner or later possibly bring them there. In early August they suddenly became quite plentiful and were seen then scattered through the open woods on the higher ridges as much as in the meadows. At all times they were noisy and conspicuous, and by no means a bird that could be overlooked.

Myiochanes richardsoni richardsoni. WESTERN WOOD PEWEE.—A scarce summer resident, and seen only in the scattered short stretches of woods about the town. A nest found July 4 held four well grown young and was thirty feet from the ground and twenty feet out at the outer end of a limb of a large white pine. The trees here were well draped with strands of lichens and for this reason this nest was unusually well concealed.

Empidonax hammondi. HAMMOND'S FLYCATCHER.—This species was confined to clearings and open spots in the heavy timber in the valleys, and as these were few and far between these birds were as a consequence a little scarce.

Otocoris alpestris merrilli. DUSKY HORNED LARK.—It was not until August 30 that I recorded this species for the first time, a small flock of six birds being seen feeding at the edge of a talus slope at the

top of the mountain. Within a few days however such small flocks were of common occurrence, especially early in the morning, flying by overhead or pausing for a short time to feed on the open slopes at timberline.

Pica pica hudsonia. MAGPIE.—Seen but once, a single bird Sept. 14 in the top of a tree at the edge of a field near the town.

Cyanocitta stelleri annectens. BLACK-HEADED JAY.—This species was quite plentiful here but showed a decided preference for the more open country in the valleys so while I saw it both about Clark's Fork and on Trestle Creek it was entirely wanting on Lightning Creek. Small, noisy flocks, probably family parties, were always encountered on my occasional trips to Trestle Creek, but they never wandered far up the mountain sides.

Perisoreus canadensis capitalis. ROCKY MOUNTAIN JAY.—I have but two records for the occurrence of this species here although, being quiet and inconspicuous, it may possibly be more plentiful than my notes would indicate. On July 4 three birds were seen in a stretch of woods near the town, and on July 21 three were found quietly feeding in the firs below my lookout station.

Corvus brachyrhynchos hesperis. WESTERN CROW.—Fairly plentiful about the town but seen nowhere else.

Nucifraga columbiana. CLARKE'S NUTCRACKER.—This was one of the commonest and most characteristic birds of the open woods at timberline and was seen daily throughout the summer. Always noisy, they were if anything more so during the latter part of August and they indulged then in gymnastics that were as varied as interesting. One of their favorite amusements was to fly high into the air until almost out of sight, and then return to the place they had started from in a number of long swift swoops, repeating this again and again until they tired or became temporarily hungry.

Dolichonyx oryzivorus. BOBOLINK.—Fairly plentiful about the town, males being seen during early July hovering singing over many of the open fields and pastures.

Molothrus ater ater. COWBIRD.—I saw this species about Clark's Fork, and it is probably a fairly common summer resident in the open valleys.

Sturnella neglecta. WESTERN MEADOWLARK.—Plentiful in the open fields and pastures about and in the town. July 4 a bird was seen with food in its bill for young evidently nearby judging from its uneasiness. By the middle of September they had begun to gather into small flocks, fifteen being seen Sept. 14 on a telephone wire at the side of the road. Several were heard singing that day.

Euphagus cyanocephalus. BREWER'S BLACKBIRD.—Near one edge of the town was an open marsh, overgrown to a slight extent with alders, and here I found a small colony of possibly ten pairs of these birds breeding, the young being out of the nest and fairly well grown the first week in July.

Pinicola enucleator montana. ROCKY MOUNTAIN PINE GROSBEAK. —It was the latter part of the summer before I first saw this species here but it unquestionably breeds, sparingly at least, well back in the mountains. On Sept. 6, a small flock of six birds was seen, all of them in the dull gray plumage, and on Sept. 10, three birds, two of them adult males, were noted, feeding each time on or near the ground in the open woods well up the mountain side.

Carpodacus cassini. CASSIN'S PURPLE FINCH.—Very plentiful throughout the summer in the open woods on the higher ridges. During July they could be heard singing at all hours of the day from the tops of the trees, one bird being seen, on the 10th, giving a flight song, circling and hovering high in the air as it sang. By the latter part of August they had gathered into large flocks and it was not unusual to see as many as fifty feeding together then.

Loxia curvirostra minor. RED CROSSBILL.—Like the last, this species was very plentiful throughout the summer on the higher ridges but almost invariably small, restless, noisy flocks were seen, flying by overhead or feeding in the tops of the firs. At rare intervals one was heard singing but no evidence of breeding was noted.

Spinus pinus. PINE SISKIN.—I found this species very plentiful here, both about Clark's Fork and on Trestle Creek, as well as in the open woods at timberline. They seemed to shun the heavy timber in the valleys and none were seen on Lightning Creek. Invariably they occurred in small flocks and had seemingly finished nesting by the first of July.

Pooecetes gramineus confinis. WESTERN VESPER SPARROW.—Seen only in the open fields about the town where it is seemingly a scarce summer resident.

Passerculus sandwichensis alaudinus. WESTERN SAVANNAH SPARROW.—A fairly plentiful summer resident in the open fields and pastures about the town.

Zonotrichia leucophrys gambeli. GAMBEL'S SPARROW.—This species may possibly breed here although I recorded it as an early fall migrant only. The first bird was seen Aug. 27, feeding in a thicket at the edge of one of the open mountain meadows, and by Sept. 9 they had become fairly plentiful about my lookout station. It may easily be that they nest in open spots in the valleys and wander up the mountain sides during late summer, although I have no direct evidence to this effect.

Spizella passerina arizonae. WESTERN CHIPPING SPARROW.—A very plentiful summer resident. Two nests found during July show clearly the adaptability of this species to widely varied conditions. The first, found July 4 with four well incubated eggs, was six feet from the ground in a small Douglas fir at the edge of an open field near the town. The second, that on July 19, held four fresh eggs, was five and a half feet from the ground in the top of a small alpine fir at the edge of a thicket practically at timberline, and fully forty miles from the nearest civilization. Both

nests were similar in construction, being compactly built of weed stems, rootlets and grasses, lined with horse hair.

Junco hyemalis montanus. MONTANA JUNCO.—This species was common in the open valleys and well up the mountain sides, but showed a decided aversion to the thick timber such as was found on Lightning Creek and none were seen in such spots. By the middle of July these birds had gathered into quite large flocks, for on the 16th fully a hundred were seen feeding at the edge of a large snow drift near the top of the mountain. The following day, however, a female was seen gathering nesting material and seemingly preparing to raise a late brood.

Melospiza melodia montana. MOUNTAIN SONG SPARROW.—Fairly plentiful in the thickets and underbrush about the town. Only once was it seen near the lookout station, a single bird being found Sept. 5 feeding at the side of a trail through the open woods.

Melospiza lincolni lincolni. LINCOLN'S SPARROW.—One or two pairs bred in the scattered open meadows at the top of the mountain and during July the males could be found at various times during the day singing from the tops of the larger trees. At all times they were timid and hard to approach, disappearing at once in the nearest brush if any attempt was made to get a good view of them.

Passerella iliaca schistacea. SLATE-COLORED FOX SPARROW.—It was August 1 before I first recorded this species here, two birds being seen that day feeding in underbrush (throughout the remainder of the summer), bordering a small stream in one of the open meadows. From that date on however they were seen at infrequent intervals and possibly breed sparingly through these mountains.

Pipilo maculatus montanus. SPURRED TOWHEE.—Fairly plentiful on the brushy hillsides about the town, and singing during early July. A young bird of this year, fully grown, was seen July 21 feeding in underbrush near my lookout station, illustrating again the tendency of many of the birds to wander to the tops of the mountains during the summer months.

Hedymeles melanocephala. BLACK-HEADED GROSBEAK.—This species was found to breed sparingly in the deciduous underbrush bordering the streams in the open valleys. A nest found July 4 was twenty feet from the ground in the top of a small slender willow at the edge of underbrush bordering a small creek, and was built of coarse weed stems, lined with finer ones. The male bird was flushed from the four well incubated eggs.

Passerina amoena. LAZULI BUNTING.—Plentiful and singing during early July in the underbrush about the town.

Piranga ludoviciana. WESTERN TANAGER.—This species was a plentiful summer resident here, scattered pairs being seen in the heavy timber in the valleys. It was not until the latter part of August that they were seen at timberline but they finally did appear there in small flocks that were probably family parties.

Petrochelidon lunifrons lunifrons. CLIFF SWALLOW.—Plentiful and breeding in small colonies in and about the town. One large barn held the majority of the nests although two found July 5, with the birds seemingly incubating in both, were under the eaves of the school house.

Iridoprocne bicolor. TREE SWALLOW.—My one record for the occurrence of this species here was a flock of eight birds seen July 3 on a telephone wire at the side of a road. It is probably a fairly common summer resident.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—I found but one pair of these birds breeding here but their scarcity was probably due to lack of suitable places to nest. The one nest I did find was rather unexpected, and in a spot where I had no thought of coming across this species. A small clearing had been made in a narrow valley deep in the woods and at the side of a swift rather turbulent stream. The removal of the timber had eventually caused a landslide that had formed a high steep bank at the side of the stream. Near the top of this the birds had excavated a shallow pocket and built a nest that on July 4 held six well incubated eggs. It seemed strange to me to see them feeding over the tops of the trees so deep in the woods, for I had always associated these birds with rather open country.

Bombycilla cedrorum. CEDAR WAXWING.—Very plentiful in and about the town where, on July 5, two nests were found. The first held five slightly incubated eggs and was fifteen feet from the ground in the top of a small slender larch at the edge of some underbrush at the side of a road. It was compactly built of larch twigs, grasses and moss, lined with the dry needles of the western white pine. The second which held two fresh eggs was six feet from the ground in a small Douglas fir at the edge of a field, and was built of weed stems and wool, lined with wool and dry pine needles.

Vireosylva olivacea. RED-EYED VIREO.—Fairly plentiful in the open woods about the town, but seldom seen far from the deciduous underbrush that bordered the streams.

Lanivireo solitarius cassini. CASSIN'S VIREO.—I found this species fairly plentiful in the open cut-over timber on Trestle Creek but saw it nowhere else. Seemingly they have no liking for the thick woods for none were seen on Lightning Creek throughout the summer.

Vermivora ruficapilla gutturalis. CALAVERAS WARBLER.—This species was limited to the thick underbrush on the south slopes of the mountains but here it was fairly plentiful and seen throughout July and August.

Vermivora celata celata. ORANGE-CROWNED WARBLER.—A pair of these birds bred in one of the open meadows near my lookout station but I saw them nowhere else during the summer. They could always be found about a thicket of small alpine firs and here the male was frequently heard singing until early in August. The nest was unquestionably close by but

I made no effort to find it as the young had probably flown by the first of July.

Dendroica aestiva aestiva. YELLOW WARBLER.—A plentiful summer resident in the deciduous underbrush about the town.

Dendroica auduboni auduboni. AUDUBON'S WARBLER.—I found this species a plentiful summer resident here, especially in the open fir woods on the higher ridges. A female was seen July 22 gathering nesting material on the ground but an attempt to trail her to the nest was unsuccessful. After the middle of August small restless flocks were frequently encountered, and they were still much in evidence when I left early in September.

Dendroica townsendi. TOWNSEND'S WARBLER.—This was a fairly common summer resident here but it showed a decided partiality for the ravines and the thick timber in the valleys and was rarely seen elsewhere. Toward the latter part of August an occasional bird appeared in the open woods near timberline and my last day at the lookout station, Sept. 10, an adult male was seen.

Oporornis tolmiei. MACGILLIVRAY'S WARBLER.—I found this species a fairly plentiful summer resident in thickets and underbrush about the town, with an evident preference for the vicinity of water. Early in August they appeared for the first time in the open mountain meadows near timberline, and lingered there as late as Sept. 3.

Geothlypis trichas occidentalis. WESTERN YELLOW-THROAT.—Like the last fairly plentiful in the thickets and underbrush about the town.

Icteria virens longicauda. LONG-TAILED CHAT.—One bird was seen July 4 in underbrush at the edge of a field, my only record for the occurrence of this species here. Seemingly it breeds but sparingly.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—This was one of the characteristic breeding birds of the open meadows at the edge of timberline, scattered pairs being found in the underbrush bordering the small streams. They were seen throughout the summer, my latest record being that of an adult male seen Sept. 10 in the open fir woods part way up the mountain side.

Setophaga ruticilla. REDSTART.—This species was a rather scarce summer resident for I have but one record for its occurrence here, an adult male being seen July 4 feeding in the lower branches of a large white pine at the edge of a field.

Anthus rubescens. PIPIT.—This species possibly breeds well above timberline on some of the higher peaks found here but I recorded it as a migrant only. It was not until Sept. 12 that the first birds appeared, a flock of fully fifty being seen that day feeding on a talus slope below the lookout station.

Cinclus mexicanus unicolor. DIPPER.—This species probably breeds on many of the numerous streams here. I saw it twice, one bird Aug. 29 on Lightning Creek and again a single bird Sept. 12 on Trestle

Creek. They were feeding each time about the rocks and boulders that lined the shore, and were silent and a little timid.

Dumetella carolinensis. CATBIRD.—Seen only in underbrush about the town, but fairly plentiful there.

Troglodytes aedon parkmani. WESTERN HOUSE WREN.—I found this species a common summer resident in and about the town. A pair seen July 4 investigating a hole in an old stub at the edge of a field were seemingly contemplating a second brood for five fully grown young were seen that day.

Nannus hiemalis pacificus. WESTERN WINTER WREN.—This was one of the few birds that showed a decided preference for the thick timber in the valleys and avoided entirely the more open country. Scattered birds, usually males, singing, were seen on Lightning Creek, feeding in the more secluded spots about old logs and piles of brush.

Sitta carolinensis nelsoni. ROCKY MOUNTAIN NUTHATCH.—This species seemingly breeds here but sparingly for I saw but a single bird the entire summer, one appearing Aug. 11 in the open fir woods below the lookout station and lingering there for two days.

Sitta canadensis. RED-BREASTED NUTHATCH.—This was a common bird in the open fir woods well up the mountain sides and one or two could always be seen during even the shortest walk. None were noted in the valleys throughout the summer.

Penthestes atricapillus septentrionalis. LONG-TAILED CHICKADEE.—This species was fairly plentiful in the open valleys and was seen during the summer both in the stretches of woods about the town and in the cut-over timber on Trestle Creek.

Penthestes gambeli gambeli. MOUNTAIN CHICKADEE.—Unlike the last this was distinctly a bird of the higher mountain ridges for while none were seen in the valleys it was fairly common in the open fir woods near timberline. Aug. 28 a female in soiled worn plumage was found feeding a young bird whose fluffy feathers and short, stubby tail showed it had not been long out of the nest.

Penthestes rufescens rufescens. CHESTNUT-BACKED CHICKADEE.—The heavy timber in the valleys seemingly offered no inducements to the preceding two species but this bird found it more to its liking and while it never wandered far up the mountain sides or into the more open country it occurred fairly plentifully in the secluded ravines and narrow, thickly wooded valleys. During my infrequent trips to Lightning Creek I always encountered small flocks of these birds, and soon came to associate them with Western Winter Wrens and Northern Varied Thrushes that showed a similar preference for such spots.

Regulus satrapa olivacea. WESTERN GOLDEN-CROWNED KINGLET.—Scattered pairs of these birds bred along the streams in the valleys, small flocks wandering during the summer well up the mountain sides where, in August and early September, they were found feeding in the open fir woods.

Regulus calendula calendula.—RUBY-CROWNED KINGLET.—It was not until Aug. 23 that I first recorded this species, four birds being seen that day feeding, singing, in the lower branches of several alpine firs at the edge of an open meadow. They soon became plentiful and were seen daily about the lookout station. They probably breed to some extent through these mountains as this lies within their summer range, and I am somewhat puzzled that I did not see them earlier in the summer.

Myadestes townsendi. TOWNSEND'S SOLITAIRE.—Probably a fairly common summer resident here for during August and early September one or two birds were seen at frequent intervals about the lookout station.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—I found this species a plentiful summer resident in the heavy timber in the valleys. July 6, while following a trail through the woods on Lightning Creek, three nests were found, in one four incubated eggs and in the other two, three eggs each, equally well incubated. All were in hemlocks, varying in height from four to ten feet from the ground, and were similar in construction, being small and compact and built of fine twigs, grasses, bits of rotten wood, shreds of inner bark and moss, lined with skeleton leaves and moss.

Hylocichla guttata auduboni. AUDUBON'S HERMIT THRUSH.—A fairly plentiful summer resident in the open meadows on the higher ridges. None were seen in the valleys nor in fact below an altitude of 6000 feet. They seemingly breed late for they were heard singing throughout July, and on July 17 two were seen carrying food to young still in the nest.

Planesticus migratorius propinquus. WESTERN ROBIN.—A common summer resident in the valleys, wandering during August to the edge of timberline where small noisy flocks were frequently encountered.

Ixoreus naevius meruloides. NORTHERN VARIED THRUSH.—This was a common bird in the thick timber in the valleys, especially in the more secluded ravines. Quiet and inconspicuous during the day, at dusk they would sing from the very tops of the larger trees and their short, weird song could then be heard on all sides. A late nest found August 7 held three well incubated eggs and was fifteen feet from the ground and twenty feet out at the outer end of a limb of a large hemlock at the side of a swift roaring stream in a deep wooded ravine. It was substantially built of hemlock twigs and moss, lined chiefly at the bottom with soft crushed fragments of weed stems. The female was incubating and on being flushed disappeared without a sound in the underbrush and was not seen again. The eggs were light blue, with a cluster of fine dots of light brown and lavender at the larger end.

Sialia currucoides. MOUNTAIN BLUEBIRD.—I found this species a plentiful summer resident wherever any open country occurred, not only in the valleys but also on the higher mountain ridges. A nest found July 10 held well grown young and was fifteen feet from the ground in a cavity in an old fire-killed tree in a burned-over area almost at timberline.

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THE BREEDING BIRDS OF THE VICINITY OF BLACK BAYOU AND BIRD ISLAND, CAMERON PARISH, LOUISIANA.

BY J. D. FIGGINS.

THROUGH the courtesy and generous assistance of Capt. Wm. E. Lea, of Orange, Texas, the writer enjoyed the privilege of making a brief study of the breeding birds of the regions of Black Bayou, and Bird Island, Cameron Farm, Cameron Parish, Louisiana, during a period of eight days in June, 1919. Owing to Capt. Lea being thoroughly familiar with the location of all important breeding places and the best routes to reach them, the results of the work were far greater than would have been possible under less favorable conditions. Besides the pleasure of expressing my appreciation of the many courtesies extended me by Capt. Lea and the delightful hours I spent in his company, it is due him that recognition be given his successful efforts in protecting the breeding birds of that region.

Black Bayou is a deep, sluggish stream having its source near the Intercoastal Canal and discharging its dark waters into the Sabine River. So tortuous is its course that its length is probably not less than eight or ten times the distance in a straight line between its source and the point where it empties into the Sabine. Previous to the cutting of short canals across narrow strips of marsh, to avoid frequent detours, a mile or more was necessary to make a hundred or two feet of progress in the desired direction. Innumerable laterals, similar in every respect to the main stream, wind equally crooked courses far into the marsh and like the principal channel, are bordered with cypress. The entrances to many of these laterals are masked with floating vegetation, while others present a width, for short distances, that is equal to that of the main bayou. Some are lost to sight entirely, for while much of the contiguous region is under water to a depth of from four to twelve or fifteen feet, the surface is largely covered with a mass of floating vegetation, from which grows "seacane" ten to fifteen feet in height.

During seasons of normal rainfall, there is little firm ground exposed in the immediate vicinity of Black Bayou, but shallows

are indicated at many points by the presence of cypress trees—singly or in small clumps and rarely are these approachable except by crawling on hands and knees at the constant risk of breaking through the floating vegetation.

What little travel there is on the upper portion of Black Bayou is confined to small launches and the pirogue of the alligator hunter, and it is agreed by residents of the region that no one individual is familiar with more than a small section of the bayou and its ramifications—which, in all, amount to not less than one hundred miles in length, probably, much more. It would, therefore, be impossible to more than roughly estimate the number of birds breeding there, though an entire season were devoted to such an investigation. Merely passing through the main bayou is very disappointing to one expecting to see birds in considerable numbers and variety. He will not be rewarded except he follow the venturesome alligator hunter into the numerous laterals and deep recesses where the rookeries are hidden away, for these hunters are the only men who are really familiar with their little section of the bayou and marsh.

To the southeast, the water of the marsh shallows and seacane give place to sawgrass and tules, many flowering aquatic plants such as sagittaria, pickerel weed, lotus, spider lily, yellow and white pond lilies, and occasionally, pink and white mallows. In this form, the marsh extends for miles, with here and there ponds of open water varying in depth from three or four inches to as many feet, except at the points marked by "islands." These are the reverse of the usual conception of the term, for instead of being raised land, they are depressions where permanent water, however dry the season, is productive of a dense growth of cypress, gum and willow. "Bird Island," eight miles east of Black Bayou, is the most prominent and well-known because of the number and variety of birds that make it their breeding place.

Black Bayou forms the approximate western boundary of Cameron Farm, much of which is slightly raised above the general level of the great marsh stretching to the gulf coast and at one time was largely devoted to the cultivation of rice. This cereal attracted large numbers of Redwings, Grackles, Ducks and Geese and so destructive did these birds become, it was necessary to aban-

don the industry and permit the land to revert to its former luxuriant stand of native grasses. This resulted in a reduction in the number of birds that winter there, but from the standpoint of bird life, the loss was more than compensated by a greater area being available for breeding species and an enormous increase in their numbers.

Like much of the coastal plain region of Louisiana, Cameron Farm is marked by the frequent occurrence of low, circular mounds known locally as "blisters," or "pimples"—the result of mud being forced to the surface by escaping gas. As a rule, these mounds do not exceed three feet in height, more often less, and vary in diameter from twenty to a hundred feet. They are bordered with bulrushes and high grasses and are generally covered with shorter varieties of vegetation, over and through which, spreads a tangle of trailing blackberry vines,—the nesting place of such species as Bob-white, Dove, Black Vulture, Meadowlark, etc. Although quite twenty miles from the Gulf, Cameron Farm is but four feet above sea level and since the intervening area is overgrown with very dense aquatic vegetation, drainage is greatly retarded and only during protracted periods of drought does the water in the marshes become exhausted.

It is not improbable this occasional drying up of the water influences the birds, to some extent, at least, in the selection of Bird Island as their nesting place. It is the southernmost of the larger islands and marks the deepest portion of a more or less open slough some miles in length which ultimately merges with the deeper waters towards the Gulf. Thus the advantages of its position are two-fold, for besides the protection afforded them, regardless of how lacking in rainfall the season may prove, the birds are never a great distance from permanent water and a consequent source of food.

Between Bird Island and Black Bayou, and stretching far to the south, is a vast breeding ground of many species of birds that profit by its abundant store of food. Crayfish and several species of frogs and small fishes are very plentiful and underwater vegetation teems with insect larvae and other invertebrates. Such were the conditions and environment I found when visiting the region for the first time, on June 16, 1919, and following is a list of the birds

found in the region treated, together with notes on their breeding habits:

Anhinga anhinga. ANHINGA.—Breeding Anhingas were not as abundant on Black Bayou as conditions appeared to warrant, but many nest there and in the vicinity of Bird Island. At the latter point, the nests were largely confined to the cypress trees, often forty or fifty feet above the water and contained broods of young in various stages of development from birds not over a week old to others nearly ready to fly. Clumps of low willows near the island also contained nests, but no effort was made to learn their contents. Of interest were the habits of these birds when feeding. After diving and remaining under water for a considerable time, instead of coming to the surface, the Anhingas merely exposed the head and after a few seconds renewed their fishing—this being repeated several times. When leaving the water the bird appeared to rise with much difficulty and its flight was labored to a degree.

Phalacrocorax vigua mexicanus. MEXICAN CORMORANT.—On June 20, several cormorant nests containing young were noted. They were placed in exposed positions on small, spreading cypress trees some ten or fifteen feet above the water and associated with nests of Anhingas. This small colony—the only nesting birds observed—was on a lateral arm of Black Bayou about half a mile from the main channel and when first approached, the adult birds were much disturbed. Returning some hours later, during a heavy rainstorm, I found the parent birds very reluctant to leave the nests, where they perched on the windward side with every appearance of an attempt to shield the young from the pelting rain. There was a noticeable variation of the size of the young, similar in every respect to that in broods of young Anhingas.

Anas fulvigula maculosa. MOTTLED DUCK.—If the larger ponds of open water are approached with care and under cover of heavy vegetation, one is generally rewarded with a view of a female Mottled Duck and her brood. At the first alarm, the young dive and swimming below the surface of the water, seek cover, while the mother bird, greatly excited, threshes the water with her wings and makes every effort to attract attention to herself. On one occasion, I came upon a brood of young in water not more than six or eight inches in depth and could easily follow the underwater course of the young by the ripples they created. When in need of air, they thrust the bill from the water barely sufficient to expose the nostrils—always beside some growing vegetation or floating object and after a few hasty breaths, renewed their efforts to escape. These birds are highly susceptible to domestication and when hatched and reared in captivity, may be given their entire freedom if the wing is clipped. Several nests of such examples were found in the first week in February, 1920, and contained one to nine eggs. Half grown young have been observed as early as the first week in April and on June 24, 1919, I saw a brood of newly-hatched young which may indicate that two broods are reared. All of

the nests examined were well concealed beneath masses of dead vegetation and with the exception of that containing nine eggs, feathers and down were not present.

Ajaia ajaja. ROSEATE SPOONBILL.—Dull, indeed, is the person whose interest is not aroused by the sight of a number of Roseate Spoonbills perched upon the branches of a dead tree—a cluster of brilliant gems against a dark background of moss-draped cypress, and overhead, a cloudless sky. Such was my first introduction to these birds on Black Bayou, June 16, 1919. Owing to the fact that the birds had but recently arrived in the vicinity and had not as yet selected a definite breeding place, they were very shy and I had few opportunities to study them carefully.

For some years, the Spoonbills have enjoyed the protection afforded them by Capt. Lea, and from him and various residents of the region, equally familiar with the birds, I was enabled to learn much of interest concerning their breeding habits. Owing to the reliability of these sources of information and so unanimous were their conclusions, I was greatly surprised at Mr. T. Gilbert Pearson's account of his visit to Bird Island, which appeared in the July–August (1920) number of 'Bird-Lore,' page 259. Nor do the discrepancies which are found in Mr. Pearson's second reference to his investigations ('The Auk,' Vol. 38, pp. 516–517) tend to lessen the confusion.

In the story appearing in 'Bird-Lore,' Mr. Pearson states he visited the island on May 18, 1920, and at that time counted eighty-seven Roseate Spoonbills, and examined seventy-five nests containing eggs. In the second account, the number of birds is increased to one hundred and four, and the nests reduced to five. These discrepancies, perhaps, are subject to explanation through typographical errors and to me are of less importance than statements that appear to advance by a full month, or more, the breeding dates of the Roseates in Cameron Parish.

An opportunity to again visit Cameron Parish enabled me to review the entire matter and not the least interesting and productive of results was an interview with Mr. John Carruthers, a state game warden and for years a resident of the vicinity, who accompanied Mr. Pearson to Bird Island on May 18, 1920. This interview was helpful in establishing the number of birds observed and nests examined and seems to show that Mr. Pearson was mistaken in the identity of the nests and eggs. Mr. Carruthers says he personally counted eighty-seven Roseate Spoonbills on that date, while in company of Mr. Pearson.

In addition to this, Mr. Carruthers expressed a doubt if the eggs shown him by Mr. Pearson were really those of the Spoonbills, giving as his reason the fact that the first birds, (three in number) had not arrived in the vicinity until the previous week, or "between May 12 and 15." The evidence seems to show Mr. Carruthers was justified in entertaining such a doubt. Finally, Mr. Carruthers states he took a census of the Roseates on Bird Island in late July, 1920, and counted two hundred adults and

eighty-two nests, the latter containing "very small to a third-grown young." These dates and conditions are verified by correspondence and the investigations of others having an interest in the subject.

When passing through Black Bayou for the first time, June 16, 1919, I noted eleven Roseates perched on a dead cypress and upon making inquiries, learned that the first birds had arrived about three weeks earlier, that being the usual time of their appearance. The next day, five birds were seen at Bird Island, very shy, and left the trees when I was yet some distance away. On June 18, the birds on Black Bayou had increased to twenty-five, the largest number observed on any day during my visit there. Upon dissection of the specimens taken by the party of which I was a member, it was agreed that these examples would not deposit eggs under three weeks—there being little, if any, enlargement of the organs. This appeared to be unusually late in view of Dr. Frank M. Chapman's having found nests and eggs at Cuthbert Island, Florida, as early as March 29. Inquiries were made of Capt. Lea, the local state warden, and alligator hunters, all of whom had spent several seasons in the region of Black Bayou, and since they agree, it appears to be established that Spoonbills do not breed there before late June or early July.

No less an authority and trained observer than Mr. Stanley C. Arthur expresses a doubt if the Spoonbills breeding in the vicinity of Cameron Farm construct their own nests, believing they employ the deserted ones of Herons. Capt. Lea, an equally careful observer, and probably best informed on the subject, entertains a like view regarding the birds breeding on Bird Island, and Mr. John Carruthers makes the definite statement that the Roseates employ deserted Black-crowned Night Heron's nests. Their utilizing old nests may be due, in a measure, to the fact that by the time the Roseates begin breeding on Bird Island, the none-too-plentiful supply of nest material has been exhausted by the thousands of earlier breeding birds. A like condition does not exist on Black Bayou, and it is quite probable that there they construct their own nests. This as it may be, Spoonbills did not begin breeding on Bird Island or Black Bayou until late June either in 1919 or 1920.

Guara alba. WHITE IBIS.—Contrary to expectations, this bird and the Wood Ibis (*Mycteria americana*), were not observed in the vicinity of Cameron Farm, although it is reported to be found regularly in that region. This was due, probably, to my inability to devote more time to the large areas of tules where it is stated they nest.

Ixobrychus exilis. LEAST BITTERN.—The Least Bittern was very abundant along the principal canals and about the margin of the raised land of the southeastern portion of Cameron Farm. Many nests were found in low bushes and generally contained what appeared to be fresh eggs.

Ardea herodias herodias. GREAT BLUE HERON.—This heron is evidently one of the earliest breeding birds on Bird Island—the only point

in the region where nests were observed. When passing the island in February, 1920, not less than seventy bulky structures were seen on the top-most branches of the highest cypresses—then bare of foliage, and several of the many birds present were carrying nest material. The reluctance with which a few of the birds left the nests indicated the probable presence of eggs. My first visit to the island was in June of the previous year, at which time the young were nearly, or quite, full-grown and not a few already on the wing.

Casmerodius egretta. EGRET.—Capt. Lea informs me that this bird appeared at Bird Island only in recent years and for reasons not altogether apparent, has not increased at the rate of other species. This may be due, in part, to the fact that there are not many fish in the marshes of a size preferred by the egret at the time of breeding. Several birds were noted, however, and their lack of shyness suggested the probability that they were then rearing their young. Capt. Lea states it is a more or less regular breeder, but always in small numbers.

Egretta candidissima candidissima. SNOWY EGRET.—Many of the lateral arms of Black Bayou are the breeding places of this Egret. There it generally nests in the cypresses singly, but as many as two or three to a half dozen pairs were occasionally found associated. On Bird Island it breeds very abundantly, too numerous, in fact, to warrant an estimate of their number. In this connection, I would mention that no attempt was made to determine the number of birds and nests at any point visited, either at Cameron Farm, or elsewhere, other than in a very general way. I view the practice as unnecessary and highly doubtful of useful results. Much harm follows such a procedure, both in the destruction of the young and eggs that are dislodged from such frail structures as Egret and Heron nests and through disturbing the shyer species. On Bird Island the nests of the Snowy Egrets were on low willows, as a rule, together with those of the Louisiana and Little Blue Herons, although not a few nested on the cypress trees.

Hydranassa tricolor ruficollis. LOUISIANA HERON.—Many of these birds were nesting in the willows of Bird Island but, owing to their timid disposition, they appeared to prefer the less noisy and more secluded tributaries of Black Bayou. No nests were seen on the main channel of the latter stream, but nearly every lateral revealed a few pairs, singly or in small groups. These were in cypress trees, seldom more than six or eight feet above the water and contained young well advanced (frequently nearly grown), and able to scramble to higher perches when approached.

Florida caerulea. LITTLE BLUE HERON.—At Bird Island, Little Blue Herons were very abundant in late June and many nests containing eggs were observed in the low willows. In a clump of small willows a half mile north of Bird Island, twenty or more birds in immature plumage were associated with a few adults, but a lack of time prevented my making an investigation to determine if they were breeding.

While it has been shown that these birds breed while in the white and mixed plumage, the fact that so high a percentage were isolated, leads me to believe they were non-breeders and this is strengthened by the evidence of frequently seeing like examples at distances of some miles from the Bird Island colony and the absence of adult birds among them. During January and February, 1920, immature birds were noted at frequent intervals about Cameron Farm. At this time only an occasional adult was seen.

Butorides virescens virescens. GREEN HERON.—Green Herons were not noted at Bird Island, nor did I see them on Black Bayou, although they may have been present in both localities. They were observed at intervals along the Cameron Farm canal and one or two nests containing young were noted. Here they nested singly.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Like the following species, this bird is a very early breeder, for at the time the Great Blue Herons were noted among the bare trees of Bird Island in February, 1920, the Black-crowned Herons had assembled to the number of several hundred and were then engaged in nest-building. None were seen outside the area of the island at this time, although they breed in less numbers on Black Bayou. On June 16, 1919, many of the young were able to fly.

Nyctanassa violacea. YELLOW-CROWNED NIGHT HERON.—The young of this and the preceding species are considered a great delicacy by many persons in Louisiana and at the rate they have been killed in the past, it is astonishing so many have survived. They nested sparingly on both Black Bayou and Bird Island in 1919 and young were already on the wing by middle June.

Grus mexicana. SANDHILL CRANE.—To the alligator hunters who occasionally venture to the south of the area of "islands," the nest and eggs, or young, of the Sandhill Crane are not exceptionally rare. Examples may also be found on the "ridges" south of Bird Island, but it is far from common there or elsewhere in that immediate vicinity. I did not observe this bird personally, but in July, 1919, I received an account of a nest having been found which contained well-advanced young.

Rallus crepitans saturatus. LOUISIANA CLAPPER RAIL.—At points where bulrushes form a growth over a considerable area, especially near the margins of ponds, or along canals, this rail is quite abundant. Like most of its relatives, it is very difficult to flush and is more often heard than seen. Nearly grown young were observed during late June.

Ionornis martinicus. PURPLE GALLINULE.—Rarely would one wade the open portions of the marsh for more than a short distance without flushing one or more pairs of these birds. Many newly-constructed nests were noted and on several occasions these were found to contain sets of fresh eggs. On June 17, a brood of newly-hatched young were seen to leave the nest and hastily secrete themselves in a nearby growth of sagit-

taria. As a rule the nest is composed of a mixture of dry and green vegetation arranged upon a dense growth of live grass or sagittaria and invariably, from my personal observations, is built over the water.

Himantopus mexicanus. BLACK-NECKED STILT.—This is an uncommon bird on Cameron Farm but one or two pairs were seen daily in a field where corn was grown the previous year. They were very noisy and two broods of young were discovered in late June, one being but lately incubated, while the others were probably a third-grown.

Oxyechus vociferus. KILLDEER.—Killdeers were met with frequently about Cameron Farm during the latter half of June, and from their actions, there was little doubt of their having eggs or young.

Colinus virginianus floridanus.—FLORIDA BOB-WHITE.—At the highest point on Cameron Farm, two or three Bob-whites were noted on several occasions. They were decidedly lacking in shyness and the female gave no sign of the presence of young. This, coupled with the repeated whistling of the male, and the fact that he was generally in the company of the female, conveyed the impression that breeding had probably not advanced beyond the stage of egg-laying.

Tympanuchus americanus attwateri. ATTWATER'S PRAIRIE CHICKEN.—I was unable to discover evidence of this now rare species, but was informed two or three pairs had been seen at frequent intervals during the previous winter and spring.

Zenaidura macroura carolinensis. MOURNING DOVE.—The mound-like patches of ground on Cameron Farm are employed as nest-sites by the doves, where it is far from a common species although a few were observed and two nests containing eggs were noted.

Cathartes aura septentrionalis. TURKEY VULTURE.—Seen singly on two or three occasions.

Coragyps urubu. BLACK VULTURE.—Black Vultures are not only very abundant in the vicinity of Cameron Farm, but are the most destructive agents to bird life, especially in the region of Bird Island. Employing the neighboring mounds above referred to as nest-sites, numbers of these birds may be seen about the heron rookery and it is a frequent occurrence to observe a vulture with a struggling young heron dangling from its beak. The destruction of young birds from this source is great and from like observations at other points, I am convinced that the use of a small caliber rifle on the vultures would be highly beneficial in bird protection, if employed at the time the nests contain young—a period when the adults are unlikely to be greatly disturbed.

In regions where cattle raising has replaced the cultivation of rice, the Black Vulture is credited with considerable damage to the herds by tearing the eyes from calves at the time of birth and instances are cited of a like treatment accorded cows while in a weakened condition. I personally saw one of these tear the tail from a small pig and was informed that the practice was of too common occurrence to excite comment. It is, there-

fore, not surprising that these birds are very unpopular and accounts for the frequent finding of their carcasses.

Haliaeetus leucocephalus leucocephalus. BALD EAGLE.—There are several nests of this eagle on Black Bayou and during January and February, 1920, two pairs of birds were observed on several occasions. The reluctance with which one pair left the nest upon my visit to the vicinity led to the conclusion they were either incubating or young had already appeared. Neither adults nor young were seen in the region during the latter part of June, 1919, and since they were known to have bred there that season, it is presumed that the young had left the nest.

Cerchneis sparveria sparveria. SPARROW HAWK.—A single example of this species, a male, was observed several times at one point on Black Bayou, but I am unable to say if it had a mate.

Ceryle alcyon alcyon. BELTED KINGFISHER.—The presence of Belted Kingfishers during the nesting season, in a region so devoid of the usual nest-sites of these birds, prompted the conclusion that they were non-breeders. Since the time of my visit there, however, evidence has come to light which suggests the possibility of their employing cavities in trees when vertical banks are not available.

While conversing with a young man, the son of a rancher living near Denver, a Kingfisher perching nearby introduced the subject of these birds. I inquired if he had ever found the Kingfisher's nest and he stated that he had frequently seen them going into holes in banks, but that they sometimes laid their eggs in holes in trees. This statement led to close questioning and as the account he gave of a Flicker having excavated a hole in a willow and the Kingfisher taking possession was so obviously sincere, I found no reason to doubt its accuracy. The presence of the birds in a flat, marshy country, many miles from any bank that might possibly serve as a nest-site is of interest and the proposal of their nesting in hollow trees is made here as a suggestion for future investigation, rather than as a definite assertion to that effect. They were not rare on Black Bayou, and I believe this points to the possibility that they may have been nesting in hollow stubs of cypress. I have frequently noted Kingfishers in similar environment and believe the subject to be worthy of careful observation.

Dryobates pubescens pubescens. SOUTHERN DOWNY WOODPECKER.—One specimen of this woodpecker was seen on Black Bayou on a number of occasions and, as it was always observed at the same point, it is quite probable that it may have been a breeding bird.

Colaptes auratus auratus. FLICKER.—A Flicker was seen on two or three occasions when passing through Black Bayou, though it is possible this may have been a single individual. No excavations were noted, but this does not signify it is not an uncommon breeding bird.

Chordeiles virginianus chapmani. FLORIDA NIGHTHAWK.—Nighthawks were extremely abundant about the higher portions of Cameron

Farm. From their actions it was apparent they were then mating. During very high water in the marshes, cattle resort to the mounds above referred to for bedding or resting and the apex of many of these mounds is bare of grass. It is reported such locations are employed by these birds as nest-sites.

Tyrannus dominicensis. GRAY KINGBIRD.—This species is extremely abundant along the canals and drainage ditches and in fact at most points where there are low bushes. The Cameron Farm canal and the southern margin of raised land appeared to be favored localities and to my surprise, they avoided the many willows of considerable size and employed low bushes for nest-sites—in many instances the nest being placed less than two feet from the ground or water. At the time of my visit they contained eggs and newly hatched young.

Molothrus ater ater. COWBIRD.—One specimen was the only example noted.

Agelaius phoeniceus floridanus. FLORIDA REDWING.—These birds were very numerous throughout the area of the more open marsh and as a rule constructed their nests in the low bushes lining the canal and ditch banks. Eggs and newly-hatched young were found in most instances.

Sturnella magna argutula. SOUTHERN MEADOWLARK.—Meadowlarks were very abundant on the higher portions of Cameron Farm and fresh eggs were noted on June 20.

Icterus spurius. ORCHARD ORIOLE.—Finding Orchard Orioles far out in the water-covered marshes and nesting on low willow bushes and weed-like shrubbery was a surprise, but not more so than in identical positions along the canals and margin of the raised land, where large willows were plentiful. The nests were poorly constructed and quite unlike those of the Orchard Oriole of the east, rarely more than three feet above the water and in some instances barely escaped the wash of the motor boats passing through the canal.

At the time of my visit to the region, the nests contained eggs and newly-hatched young and so unusual were the habits of the birds that the question of subspecific differences seemed worthy of investigation.

Megaquiscalus major major. BOAT-TAILED GRACKLE.—Throughout the marsh country this species was present in great numbers. At the time of my visit it had already reared its young and numerous deserted nests could be found among the tules marking small depressions in the marsh.

Cardinalis cardinalis cardinalis. CARDINAL.—A single male was noted several times on Cameron Farm canal.

Spiza americana. DICKCISSEL.—Not uncommon on the dryer portions of Cameron Farm. Males were in full song and, although no nests were seen, it is probable these birds were breeding.

Geothlypis trichas ignota. FLORIDA YELLOW-THROAT.—Several noted on Cameron Farm, where it no doubt breeds.

Mimus polyglottos polyglottos. MOCKINGBIRD.—One frequently heard singing about the residence on Cameron Farm.

Thryothorus ludovicianus ludovicianus. CAROLINA WREN.—Seen and heard in song on several occasions.

Sialia sialis sialis. BLUEBIRD.—Capt. Lea reports the Bluebird as a not infrequent summer resident on Black Bayou, but lacks definite information as to its breeding there.

Denver, Colorado.

EIGHTH ANNUAL LIST OF PROPOSED CHANGES IN THE A. O. U. CHECK-LIST OF NORTH AMERICAN BIRDS.

BY HARRY C. OBERHOLSER.

This is the Eighth Annual List of proposed A. O. U. 'Check-List' additions and changes in the names of North American birds. Like the seven already published,[1] the present list comprises only ornithological cases—i. e., such as require specimens or the identification of descriptions for their determination—and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be the result of revisionary work are included; therefore no mention is here made of changes involved in names in local lists or elsewhere, used without sufficient explanation or not known to be based on original research, of changes or additions queried or but tentatively made, or of the elimination of subspecies by authors who, on general principles, recognize no subspecies. Furthermore, no opinion beyond that of compiler is herein expressed.

This list is intended to include everything pertinent up to December 31, 1922, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not at all unlikely that some names or changes have been overlooked, and the writer would be very thankful for reference to any omissions, in order that such may be duly given a place in next year's list.

[1] For these previous lists, see 'The Auk,' XXXIII, October, 1916, pp. 425–431; XXXIV, April, 1917, pp. 198–205; XXXV, April, 1918, pp. 200–217; XXXVI, April, 1919, pp. 266–273; XXXVII, April, 1920, pp. 274–285; XXXVIII, April, 1921, pp. 264–269; XXXIX, April, 1922, pp. 243–249.

ADDITIONS AND CHANGES IN NAMES.[1]

†**Thalassarche chlororhyncha** (Gmelin). *Diomedea chlororhynchos* Gmelin, Syst. Nat., I, ii, 1789 (before April 20), p. 568 ("ad Caput bonae spei, in mari australi extra tropicos"). Recorded as North American from a specimen taken off Machias, Maine, near Seal Island, New Brunswick. (*Cf.* Murphy, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 58; Bent, Bull. U. S. Nat. Mus., No. 121, October 19, 1922, p. 19.)

†**Calonectris kuhlii kuhlii** (Boie). *Procellaria kuhlii* Boie, Isis (von Oken), XIX, No. 3, March, 1835, col. 257 ("corsicanischen Küste"). Recorded as North American from specimens taken off the coast of Long Island, New York. (*Cf.* Murphy, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 59.)

Fregetta leucogaster (Gould) becomes **Fregetta tropica** (Gould) (*Thalassidroma tropica* Gould, Annals and Mag. Nat. Hist., ser. 1, XIII, No. 85, May 1, 1844, p. 366; "the Atlantic, where it is confined to the equatorial regions"), because the latter is identical and has anteriority. (*Cf.* Kinghorn and Cayley, 'Emu,' XXII, No. 2, October 1, 1922, pp. 81–95.)

†**Euolor olor** (Gmelin). *Anas olor* Gmelin, Syst. Nat., I, ii, 1789 (before April 20), p. 502 ("Russia, Siberia"). Introduced and apparently naturalized on the Hudson River, New York. (*Cf.* Crosby, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 100.)

†**Aramus vociferus holostictus** (Cabanis). *Notherodius holostictus* Cabanis, Journ. f. Ornith , IV, No. 24, for November, 1856 (February, 1857 or later), p. 426 (Cuba). The Texas bird is referable to this race. (*Cf.* Miller and Griscom, Amer. Mus. Novitates, No. 25, December 7, 1921, p. 12.)

Arquatella maritima couesi Ridgway becomes **Arquatella ptilocnemis couesi** Ridgway, because considered a subspecies of *Arquatella ptilocnemis* rather than of *Arquatella maritima*. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, part VIII, June 26, 1919, p. 247.)

Arquatella maritima ptilocnemis (Coues) becomes **Arquatella ptilocnemis ptilocnemis** (Coues), because considered specifically distinct from *Arquatella maritima*. (*Cf.* Ridgway, Bull. U. S. Nat. Mus., No. 50, part VIII, June 26, 1919, p. 244.)

†**Pelidna alpina arctica** (Schiöler). New subspecies. *Erolia alpina arctica* Schiöler, Dansk Ornith. Forening Tidsskrift, XVI, Haefte 1–2, May, 1922, p. 19 (in text) ("Grönlands Östkyst"). Range: Eastern Greenland.

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[1] Additions to the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Seventh Annual Lists are marked with a dagger (†). Generic (and subgeneric) names so indicated do not now stand in these lists in either generic or subgeneric sense.

† **Vanellinae.** New subfamily of Charadriidae. Lowe, Ibis, ser. 11, vol. IV, No. 3, July, 1922, p. 490. Includes the following North American genera: *Vanellus, Podasocys, Oxyechus,* and *Himantopus.*

† **Pre-Charadriinae.** New subfamily of Charadriidae. Lowe, Ibis, ser. 11, vol. IV, No. 3, July, 1922, p. 489. Includes the following North American genera: *Leucopolius, Squatarola, Aphriza, Haematopus, Pagolla,* and *Arenaria.*

Charadrius nivosus nivosus (Cassin) becomes **Charadrius alexandrinus nivosus** (Cassin), because found to intergrade with *Charadrius alexandrinus.* (*Cf.* Oberholser, 'The Auk', XXXIX, No. 1, January (February 11), 1922, p. 73.)

Charadrius nivosus tenuirostris (Lawrence) becomes **Charadrius alexandrinus tenuirostris** (Lawrence), because *Charadrius nivosus* proves to be a subspecies of *Charadrius alexandrinus.* (*Cf.* Oberholser, 'The Auk', XXXIX, No. 1, January (February 11), 1922, p. 73.)

† **Leucopolius** Bonaparte. Again revived as a genus. (*Cf.* Lowe, 'Ibis,' ser. 11, vol. IV, No. 3, July, 1922, p. 483.) The only forms in North America are:

Leucopolius alexandrinus nivosus (Cassin).

Leucopolius alexandrinus tenuirostris (Lawrence).

† **Podasocys** Coues. Recognized as a genus. (*Cf.* Lowe, 'Ibis,' ser. 11, vol. IV, No. 3, July, 1922, p. 490.) Contains only one species:

Podasocys montanus (Townsend).

† **Canachites canadensis atratus** Grinnell, Univ. Calif. Publ. Zool., V, No. 12, March 5, 1910, p. 380 ("Cedar Bay, Hawkins Island, Prince William Sound, Alaska"). Revived as a subspecies. (*Cf.* Swarth, Univ. Calif. Publ. Zool., XXIV, No. 2, June 17, 1922, p. 206.) Range: Coast region of southeastern Alaska.

† **Spilopelia chinensis** (Scopoli). *Columba chinensis* Scopoli, Delic. Flor. et Faun. Insubr., 1786, p. 94. Introduced and apparently naturalized at Los Angeles, California. (*Cf.* Wyman, 'California Fish and Game,' VII, No. 3, July, 1921, p. 180.)

Leptotila fulviventris brachyptera Salvadori becomes **Leptotila fulviventris angelica** Bangs and Penard (Proc. New England Zoöl. Club, VIII, May 8, 1922, p. 29; "Brownsville, Texas"), nom. nov., because *Leptoptila brachyptera* Salvadori is a synonym of *Leptoptila fulviventris* Lawrence, and therefore inapplicable to the bird from Texas and eastern Mexico for which it has been used.

Cathartes aura aura Linnaeus becomes again **Cathartes aura septentrionalis** Wied, because the former is now considered to be the South American race. (*Cf.* Swann, 'Synopsis Accipitres,' part III, February 16, 1922, "Addendum to pp. 3–4," p. [1].)

Rostrhamus sociabilis (Vieillot) becomes **Cymindes sociabilis** (Vieillot), because the generic name *Cymindes* Spix (Avium Species Novae Brasiliam, I, 1824, p. 7) which antedates *Rostrhamus* Lesson, has for its

type *Rostrhamus niger* Lesson, which is the same as *Rostrhamus sociabilis* (Vieillot). (*Cf.* Oberholser, Proc. Biol. Soc. Wash., XXXV, March 20, 1922, p. 79.)

† **Buteo borealis lucasanus** Ridgway. [*Buteo borealis*] var. *lucasanus* Ridgway, in Baird, Brewer, and Ridgway, Hist. North Amer. Birds, III, 1874, pp. 258, 385 ("Cape St. Lucas"). Revived as a subspecies. (*Cf.* Swann, 'Synopsis Accipitres,' part II, January 3, 1922, p. 77.) Range: Peninsula of Lower California.

Buteo abbreviatus Cabanis becomes **Buteo albonotatus albonotatus** Kaup ([*Buteo*] *albonotatus* Kaup, Isis [von Oken], XXXI; Heft V, May, 1847, cols. 329, 954; Mexico), because the latter name is identical and of earlier date. (*Cf.* Swann, 'Synopsis Accipitres,' part II, January 3, 1922, p. 83.)

Buteo ferrugineus (Lichtenstein) becomes **Buteo regalis** (Gray) (*Archibuteo regalis* Gray, 'Genera of Birds,' I, June, 1849, p. 12, pl. VI [no locality: based on *Archibuteo* (= *Falco*) *ferrugineus* (Lichtenstein)]), because preoccupied by *Falco ferrugineus* Nordmann (in Erman's Reise um die Erde, Naturhistor. Atlas, 1835, p. 16); and *Archibuteo regalis* Gray is the next applicable name. (*Cf.* Stresemann, Ornith. Monatsb., XXX, No. 4, July 1, 1922, pp. 87–88.)

Aquila chrysaetos (Linnaeus) becomes **Aquila chrysaetos canadensis** (Linnaeus) (*Falco canadensis* Linnaeus, Syst. Nat., ed. 10, I, January 1, 1758, p. 88; "Canada"), by recognition of the American bird as subspecifically distinct from that of the Old World. (*Cf.* Swann, 'Synopsis Accipitres,' part II, January 3, 1922, p. 109.)

Haliaeetus albicilla (Linnaeus) becomes **Haliaeetus albicilla groenlandicus** Brehm (*Haliaëtos Groenlandicus* Brehm, Handb. Naturg. Vögel Deutschl., 1831, p. 16; "Grönland"), by recognition of the Greenland race as distinct from that of Europe. (*Cf.* Swann, 'Synopsis Accipitres,' part III, February 16, 1922, p. 141.)

† **Hierofalco rusticolus alascanus** (Swann). New subspecies. *Falco rusticolus alascanus* Swann, Bull. Brit. Ornith. Club, XLII, No. CCLXV, February 2, 1922, p. 67 ("Norton Bay, Alaska"). Range: Alaska.

† **Tinnunculus columbarius bendirei** (Swann). New subspecies. *Falco columbarius bendirei* Swann, Bull. Brit. Ornith. Club, XLII, No. CCLXV, February 2, 1922, p. 66 ("Fort Walla Walla, Washington State"). Range: California to eastern British Columbia.

Asio wilsonianus (Lesson) becomes **Asio otus wilsonianus** (Lesson), because found to intergrade with *Asio otus*. (*Cf.* Oberholser, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, pp. 74–75.)

Cryptoglaux funerea funerea (Linnaeus) becomes, so far as North America is concerned, **Cryptoglaux funerea magna** (Buturlin) (*Nyctala magna* Buturlin, Psovaia i Ruzheinaja Okhota, 1907, No. 6, March, 1907; Ornith. Monatsb., XV, No. 5, May, 1907, p. 80; Kolyma

River at 68° 40′ N. Lat., northeastern Siberia), since the only North American record proves to belong under the latter race. (*Cf.* Oberholser, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 73.)

Sphyrapicus ruber (Gmelin) becomes **Sphyrapicus varius ruber** (Gmelin), because considered, by individual variation, a subspecies of *Sphyrapicus varius*. (*Cf.* Swarth, Univ. Calif. Publ. Zool., XXIV, No. 2, June 17, 1922, pp. 219–220.)

Basilinna leucotis (Vieillot) becomes **Basilinna melanotus** (Swainson) (*Trochilus melanotus* Swainson, Philos. Mag., new ser., I, No. VI, June, 1827, p. 441; "Temiscaltepec. Real de Monte" Mexico), because the former name applies to some other species. (*Cf.* Simon, 'Hist. Nat. Trochilidae,' 1921, p. 313.)

† **Aethiopsar cristatellus** (Gmelin). *Gracula cristatella* Gmelin, Syst. Nat. I, i, 1788 (before July 25) p. 397 ("Sina"). Introduced and naturalized in the city of Vancouver, British Columbia. (*Cf.* Kermode, Report Provincial Museum Natural Hist. [British Columbia], for 1920 [1921], pp. 20–21.)

† **Molothrus ater californicus** Dickey and Van Rossem. New subspecies. Dickey and Van Rossem, Condor, XXIV, No. 6, December 19, 1922, p. 208 ("Buena Vista Lake, Kern County, California"). Range: San Joaquin Valley, California.

† **Pinicola enucleator carlottae** Brooks. New subspecies. Brooks, Condor, XXIV, No. 3, June 10, 1922, p. 86 ("Masset, Graham Island, Queen Charlotte Islands, British Columbia"). Range: Queen Charlotte Islands, British Columbia.

Loxia curvirostra minor (Brehm) becomes **Loxia curvirostra pusilla** Gloger (*L[oxia]. pusilla* Gloger, Vollst. Handbuch Naturgesch. Vögel Europas, 1834, p. 356, Anm. 71; "amerikanischen"), because the latter is of identical application and of earlier date. (*Cf.* Stresemann, Ornith. Monatsb., XXX, No. 2, March 1, 1922, pp. 41–42.)

† **Junco hyemalis connectens** Coues. *J[unco]. h[yemalis]. connectens* Coues, Key North Amer. Birds, 2d ed., 1884, p. 378. Revived as a subspecies. (*Cf.* Swarth, Univ. Calif. Publ. Zool., XXIV, No. 2, June 17, 1922, pp. 243–253.) Range: Northwestern British Columbia.

† **Aimophila ruficeps canescens** Todd. New subspecies. Todd, Condor, XXIV, No. 4, July 29, 1922, p. 126 ("San Diego, California"). Range: Southweste n California and northwestern Lower California.

Motacilla lugens Kittlitz becomes **Motacilla alba lugens** Kittlitz, since regarded as only subspecifically distinct from *Motacilla alba* Linnaeus. (*Cf.* Sachtleben, Journ. f. Ornith., LXX, No. 1, January, 1922, pp. 130–131.)

Motacilla ocularis Swinhoe becomes **Motacilla alba ocularis** Swinhoe, because regarded as only subspecifically distinct from *Motacilla alba* Linnaeus. (*Cf.* Sachtleben, Journ. f. Ornith., LXX, No. 1, January, 1922, pp. 130–131.)

† **Muscicapidae.** Family added to include only the genus *Polioptila* Sclater. (*Cf.* Chubb, 'Birds Brit. Guiana,' II, 1921, p. 351.)

REJECTIONS AND ELIMINATIONS.[1]

† **Oceanodroma hornbyi** (Gray). Eliminated as probably not taken in North America. (*Cf.* Murphy, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 65.)

Dendrocygna bicolor helva Wetmore and Peters, Proc. Biol. Soc. Wash., XXXV, March 20, 1922, p. 42; "Unlucky Lake, San Diego County, California." Rejected as not separable from *Dendrocygna bicolor bicolor*. (*Cf.* Phillips, Nat. Hist. Ducks, I, December, 1922, p. 129.)

* **Hierofalco rusticolus obsoletus** (Gmelin). Eliminated because considered a color phase of *Hierofalco rusticolus candicans* (Gmelin). (*Cf.* Swann, 'Bull. Brit. Ornith. Club,' XLII, No. CCLXV, February 2, 1922, p. 66.)

* **Vireo huttoni obscurus** Anthony. Eliminated as not separable from **Vireo huttoni huttoni.** (*Cf.* Grinnell, Condor, XXIV, No. 1, January 25, 1922, p. 32; Oberholser, 'The Auk,' XXXIX, No. 1, January (February 11), 1922, p. 77.)

IN MEMORIAM: JOSÉ CASTULO ZELEDÓN.

(BORN MARCH 24, 1846—DIED JULY 16, 1923.)[2]

BY ROBERT RIDGWAY.

Plate XXXVIII.

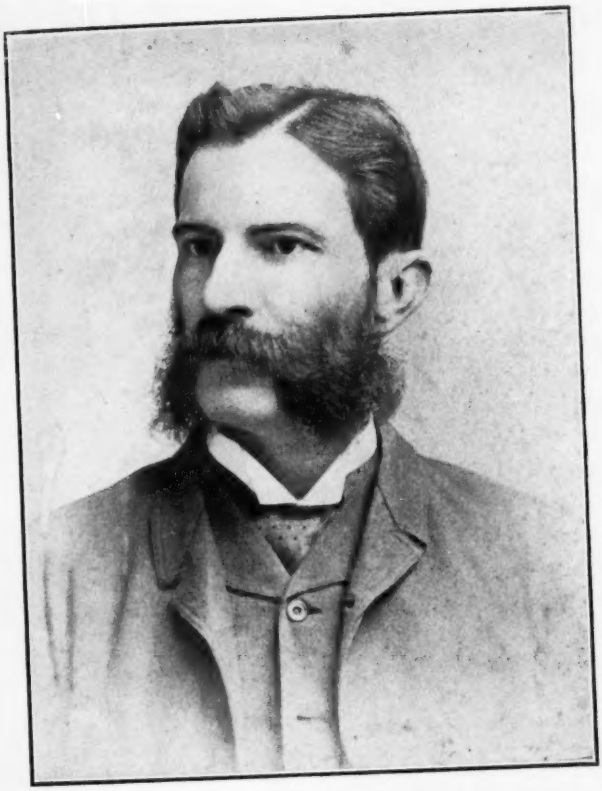
ON July 16, 1923, there passed from this life in Turin, Italy, a man who will be sadly missed by his relations, his friends, and his country.

Don José Castulo Zeledón, a Corresponding Fellow of the American Ornithologists' Union,[3] was born in Las Anonas, near San José, Costa Rica, March 24, 1846. He was a scion of a distinguished family, in whom intellectual gifts, learning, and

[1] Eliminations from the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Seventh Annual Lists, are designated by an asterisk (*).

[2] For some of the data in this memorial I am indebted to articles by Don Anastasio Alfaro in 'El Diario de Costa Rica,' of July 20 and 29, and Mr. P. W. Chamberlain, of Baltimore, Maryland.

[3] Elected at the second annual meeting, in 1884.



Josiah Hobson

love of study were common traits. His father, Don Manuél Zeledón, for thirty years governor of the district or canton of San José, was a man of great integrity, well versed in the art of governing wisely, and possessed of so wonderful a memory that it is said he remembered all the laws, on every subject, enacted since the independence of the country, in 1821, as well as all the incidents connected with their discussion in the Congress.

From earliest childhood young José took great interest in birds; but until the arrival in Costa Rica, in 1854, of Dr. Alexander von Frantzius, a German naturalist, had no one to help or direct him. Dr. von Frantzius, who was a friend and, while in Costa Rica, correspondent of Dr. Jean Cabanis, the celebrated German ornithologist,[1] established in San José a pharmacy, in which José was employed as a clerk, thus learning, under a most competent and sympathetic employer, the business which later became his avocation. This was a fortunate association for Don José who, under Dr. von Frantzius' tuition, learned the correct names of the birds of his native country and became versed in systematic ornithology. Although collecting for Dr. von Frantzius as early as 1862 his first regular field work, so far as I have been able to ascertain, was done in 1866, when he made large collections at Cervantes, six miles east of Cartago, on the road to Juan Viñas; the following year collecting at Las Cruces de Candelária, and subsequently at La Palma de San José, in the depression between the volcanoes of Irazú and Barba, at Santa Maria de Dota, Tucurrique, Pacaca, and various intermediate points. Most of the specimens then collected were sent, through Dr. von Frantzius, to the Berlin Museum.

On his return to Germany, in 1868, Dr. von Frantzius took young Zeledón to Washington, where, after introducing and commending him to Professor Baird, he was installed as an assistant (without pay) in the Smithsonian Institution, in order that he might have the opportunity to study the collection of birds there and the ornithological literature. It was there that the writer, immediately after his return from field work in Utah, under the U. S. Geological Exploration of the Fortieth Parallel, in the autumn or early

[1] Author of the well-known 'Museum Heineanum' and founder of the 'Journal für Ornithologie.'

winter of 1868, first met him, and then was begun a mutual friendship that endured to the end.

When, in 1872, Professor William M. Gabb organized his expedition to Costa Rica, Don José was appointed zoologist. In this capacity he was sent by Professor Gabb to the then unexplored wilderness of Talamanca, where he made a large and valuable collection of birds—the first ever made there—but at the cost of sufferings from hardships, privations, and starvation from which he almost perished and were the foundation of infirmities from which he was never free during the remainder of his life.

The pharmacy established by Dr. von Frantzius eventually came into Don José's possession, first as a partnership under the firm name of Herman y Zeledón (Herman and Zeledón); but after the death of his partner the latter's interest was purchased by Don José, though in respectful memory of his late associate the name of the establishment was never changed. The business grew and, under good management, the "Botica Francesa," as it was called, brought its owner a handsome competence. This business, which had grown to wholesale proportions, naturally claimed the greater part of Don José's time; but he never lost interest in ornithology and managed to make occasional collecting trips or employed others to collect for him. He thus amassed a considerable collection which, on the establishment, principally through his own efforts, of the Costa Rican National Museum, he presented to that institution.

Mr. Zeledón's services to ornithology were not so much through contributions to its literature as by other equally if not more effective means. His contributions of material for the study of Costa Rican birds was very important, comprising in the aggregate several thousand specimens, among which were a considerable number of species, several genera, and one family of birds that were new to science; but of even greater value to science were the service that he has rendered by facilitating the work of the many specialists, representing all branches of natural history, who have from time to time visited Costa Rica for the purpose of making collections and observations, each in his own particular line. In this most important co-operation Don José spared neither time, trouble, nor expense; and it may be said, in many cases at

least, that without the aid which he thus rendered, but a small fraction of the success resulting from such trips could have been realized. His wide acquaintanceship throughout the country, embracing many proprietors of large estates and others of local importance and influence, enabled him to provide for such visitors the most favorable stations for their work, arrangements for transportation, and other indispensable facilities; and so great was the respect and esteem in which Don José was held throughout the country that his name was a veritable pass-word, admitting all who bore a letter from him to the same cordial hospitality that would be extended to a long-known friend; and this in Costa Rica (as in other parts of Latin America) means more than is realized by those who have not been so fortunate as to experience it.

Mr. Zeledón did not aspire to literary honors, in fact was strangely averse to literary effort of any sort; consequently his publications are few in number, embracing, so far as I am able to ascertain at present, only four titles. The first, a 'Catalogue of the Birds of Costa Rica,' was published in 1885, in the 'Proceedings' of the U. S. National Museum (Vol. viii, 1885, pp. 104–118). The following year there appeared, in a book by Don Joaquin Bernardo Calvo, the title of which is unknown to me, a paper on Costa Rican birds with biological notes based on his personal observations; and since these were, in most cases at least, the first published information on the habits of the species mentioned, the paper is of much interest and value. In 1887 (Anales del Museo Nacionál de Costa Rica, i, pp. 103–135) there appeared a revised list of Costa Rican birds, under the title of 'Catalogo de las Aves de Costa Rica,' with localities represented by specimens in the collection of the Museo Nacionál; and the following year, in the same journal (i, 1888, p. 3), he described a new species of Wood-rail, *Aramides plumbeicollis*. He himself described or named only three of the many new species which he discovered; and of these, owing to an unfortunate and most unfair ruling of the nomenclatural experts, only one can bear his name as the describer. These are: *Aramides plumbeicollis*, referred to above; *Carpodectes antoniæ*, named by him in memory of a deceased sister (described and figured in 'The Ibis,' 5th ser., ii, Jan., 1884, p. 27, pl. 2), and *Cotinga ridgwayi* (Proc. U. S. Nat. Mus., x, 1887, p. 1, pl. 6, fig. 3).

In the field, Don José's enthusiasm and energy were unbounded, as I had ample opportunity to observe when with him on many collecting trips; and I have never known a better field ornithologist nor one more accomplished in wood-craft and other requisites of that vocation.

The limited time allowed for the preparation of this memoir prevents a careful investigation as to the number of new species and subspecies discovered by Mr. Zeledón or by collectors employed by him, and by him first brought to the notice of those who described them. The following list, somewhat hastily compiled, will show that his discoveries are numerous and important: *Aramides plumbeicollis, Attila citreopyga luteola, A. tephrocephala, Catharus mexicanus fumosus, Carpodectes antoniæ, Celeus loricatus diversus, Chlorospingus zeledoni, Coryphotriccus albovittatus distinctus, Cotinga ridgwayi, Cyanocorax affinis zeledoni, Cyanolyca argentigula, C. cucullata, Cymbilaimus lineatus fasciatus, Cypseloides niger costaricensis, Daenis pulcherrima aureinucha* (from Ecuador)[1], *Dendrornis validus costaricensis, Formicarius umbrosus, Grallaria intermedia, Idiotriccus zeledoni, Lanio melanopygius, Myrmeciza exsul occidentalis, M. zeledoni, Nyctibius griseus costaricensis, Otus cooperi, Picumnus olivaceus flavotinctus, Pipra pipra anthracina, Pittasoma michleri zeledoni, Piranga leucoptera latifasciata, Polioptila superciliaris magna, Pseudocolaptes lawrencei, Sclerurus canigularis, Tachyphonus axillaris, Thryophilus rufalbus castanonotus, Thryophilus zeledoni, Thryorchilus basultoi, Troglodytes ochraceus, Xiphocolaptes emigrans costaricensis, Xiphorhynchus nanus costaricensis, Xiphorhynchus punctigula, Zeledonia coronata.*[2] Besides these forms actually new to science, Mr. Zeledón added to the Costa Rican fauna many species already known from adjacent countries.

The name of Zeledón is perpetuated in the following new species, subspecies, genus and family of Costa Rican birds which have been dedicated to him: *Chlorospingus zeledoni, Cochlearius zeledoni, Cyanocorax affinis zeledoni, Idiotriccus zeledoni, Myrmeciza zeledoni, Pittasoma michleri zeledoni, Thryophilus zeledoni,*

[1] The type sent for description by Mr. Zeledon to the U. S. National Museum.

[2] It is probable that additional species first collected by Mr. Zeledon were described by George N. Lawrence and Dr. Cabanis.

Zeledonia coronata (new genus), and *Zeledonidæ*, the last a very distinct family, containing, so far as known, a single monotypic genus, and peculiar to Costa Rica.

All who knew him well will agree as to Don José's personal character. He was one of the strongest and at the same time most admirable characters it has been my good fortune to know. Genuinely modest, unassuming, sincere, sympathetic, charitable, and courageous; candid in giving his opinions when asked, but never needlessly nor offensively expressing them; indifferent to the more artificial or senseless conventionalities of society, he nevertheless was deeply interested in all public questions and alert in all matters pertaining to the improvement or advancement of his country. Privately, he lived his own life, true in all respects to himself but no less true to his friends. He was full of sympathy for others, especially those whom he knew to be struggling against odds with some meritorious undertaking, either in science or business. When, through his fine business ability, he became possessed of an ample fortune none who applied to him for help were turned away, unless known to be wholly unworthy. Indeed, in many cases it was not necessary to ask for his aid, or even to drop a hint that it was desired; his keenly intuitive mind and sympathetic interest detected the need and his response was spontaneous. In this connection I cannot, in justice to his memory, refrain from giving two examples of these characteristics of Don José. Being aware that much additional material from Costa Rica was urgently needed by the U. S. National Museum in the preparation of 'Birds of North and Middle America,' and knowing that the funds at the command of the Museum were not sufficient to cover the expense of an extended visit to that country, he generously proposed to pay all the expenses, not only those necessarily incurred while actually in the field but also the cost of transportation from Washington to San José and return; not only this, but he gave a very large part of his valuable time, during the nine months that were employed in collecting there, to the service of our National Museum, accompanying me on all trips or delegating his friend Don Anastasio Alfaro, Director of the Museo Nacionál, to take me in charge on the few occasions when he himself was unable to go. Further, he and Don Anastasio induced the Government to detail

the taxidermist of the Museo Nacionál to accompany me, thus relieving me of the drudgery of preparing specimens and leaving me vastly more time for exploration and observation. It is a great pleasure for me to testify to the perfection of all the arrangements made by Don José, the minutest details having been attended to with such thoroughness that there was never the slightest "hitch," delay, nor annoyance of any kind. Our cartmen (*carreteros*) and packers were invariably ready when required—indeed it was sometimes they who had to wait—and I can say with truth that, no matter what the experience of others may have been, I saw nothing of that "mañana spirit" so often mentioned by travellers; in short, I have nowhere observed service more prompt or efficient.

It was during our second visit to Costa Rica that the subject of an undertaking with which I had long been struggling was casually mentioned. The sympathetic interest of Don José was at once aroused, and he generously offered to remove the main obstacle to the completion of the task. Otherwise, it is safe to say, 'Color Standards and Color Nomenclature' would not, in all probability, have been completed, much less published.[1] Although sometimes sure beforehand that no return would ever be made, he seldom if ever refused the importunity of friends, and therefore he was sometimes shamefully imposed on; but such experiences neither soured his disposition nor prevented him from helping others.

Don José loved his home, which he had the good taste (and, fortunately, the means) to make exceedingly comfortable and attractive, and his home life was ideal. His ample means were never used for display or ostentation, which he loathed, but always for some good purpose, for he looked upon money purely as an instrument for the accomplishment of something useful. Another marked trait in his character was a staunch independence which prevented him from accepting proffered favors, especially those of a political character. During his sojourn in Washington, in 1869–71, for example, his government offered him a pension, to enable him to live more comfortably, but he refused to accept the favor, preferring the needy life of a student with pride in his

[1] The amount advanced for this purpose has been repaid from sale of the edition.

strength to endure privations; and many years thereafter, when his fine business ability and absolute integrity became a matter of common knowledge he was offered the post of Secretary of the Treasury, which he also declined.

A mutual friend[1] whom I had notified of Don José's death writes me as follows:—

"Don José C. Zeledón was one of those choice spirits of whom Latin America has given far more than its share to civilization. . . . Of how highly the *naturalista* is regarded throughout the length and breadth of Latin America you know as well as I . . . . The first I knew of his work was an acknowledgment of contributions received [at the Smithsonian Institution] from him during the incumbency of Professor Henry."

Mr. Zeledón was married, at San José, on May 8, 1895, to Señorita Amparo Lopez Calleja, who with two adopted daughters, two brothers, and other relatives survive him, and to whom are extended deepest sympathy and condolence.

Olney, Illinois, August 21, 1923.

GENERAL NOTES.

The Sooty Shearwater (Puffinus griseus) on the New Jersey Coast.—On June 1, 1923, I picked up a Sooty Shearwater which had been cast up on the sea beach near Cape May Point, N. J. The plumage was slightly soiled by oil but apparently there was not sufficient to have caused its death. It was in good condition and had evidently been dead but a short time.

Mr. Wharton Huber spoke of this occurrence to a fisherman of his acquaintance at Corson's Inlet a few miles further up the coast and was informed that these dark birds were then quite common near the fishing banks and in confirmation of his statement he later brought him two that were caught on June 4 with hook and line a few miles off shore. All three specimens are now in the collection of the Academy of Natural Sciences of Philadelphia.—Witmer Stone, *Academy of Natural Sciences, Philadelphia.*

The Sooty Shearwater in New Jersey.—On June 17, 1923, Mr. Turner E. McMullen and the writer examined two dead Sooty Shearwaters (*Puffinus griseus*) which we found on the beach, above high water mark,

[1] Mr. James Henry Rice, Jr.

at the lower end of Seven Mile Beach, below Stone Harbor, Cape May County, N. J. The birds had been dead for a long time as decomposition had begun, and they were unfit for preservation.

There are no recent records of the occurrence of this species on the New Jersey coast, to our knowledge, the last record being in 1898, according to Stone's 'Birds of New Jersey' (p. 68).—RICHARD F. MILLER, *Philadelphia, Pa.*

Downy Young of the Greater Snow Goose. A Correction.—During the past winter Dr. Witmer Stone was kind enough to loan me, from the collection of the Academy of Natural Sciences of Philadelphia, one of those historic Greater Snow Goslings taken by Mr. Langdon Gibson in North Greenland on July 11, 1892, and mentioned by him in his interesting paper, 'Bird Notes from North Greenland' in 'The Auk' for July, 1922.

In this article Mr. Gibson writes that: "The birds were on the nest at the time of capture" and they were "about two weeks old."

Upon examination and comparison with some downy young of the Lesser Snow Goose, of known age, in my collection, this gosling appears to be not over a day old, taking into consideration its size, freshness of natal down, etc., and if it had been two weeks old it seems doubtful if the young would still have been found near their nest.

Upon writing to Mr. Gibson and calling his attention to this apparent discrepancy, I received a very prompt and courteous reply in which he writes in part, as follows: " . . . . Considering what I know now of the breeding of geese, it is hard to explain to you now why I transcribed into my published notes what must have been an error at the time it was made, i. e., placing the age of the goslings at two weeks. You are unquestionably right in your assumption that the young birds had just hatched, for they were on the nest when taken and the gander was standing by doing sentinel duty, just as you describe.

"Don't you think it would be a good idea for you to write a letter to 'The Auk' calling attention to what should unquestionably appear as a correction."

Mr. Gibson's error was one of those to which we are all liable when specimens are not at hand for purposes of comparison.—FRED H. KENNARD, *Newton Centre, Mass.*

Piping Plover and Black Tern nesting at North Pond, Lake Ontario.—Mr. Neil Hotchkiss and I found the Piping Plover nesting at North Pond on the shore of Lake Ontario on July 14, 1923. The nest was located on the point of a sandspit which reached for a mile or so from the mainland, so that it was in an extremely isolated spot, and contained four eggs.

The adult birds showed very little fear and tried all of the usual tricks, such as feigning a broken wing, etc., to lure me away from the nest. Frequently they approached within thirty feet of where I was sitting and I

took advantage of this fact to observe them with my glasses set for twelve power magnification. I took this precaution for I wished to be certain of my identification. Later, after I had returned to Syracuse, I checked their characteristics with a birdskin of this species from the collection of the New York State College of Forestry at Syracuse University.

On July 23, I returned to the locality with the intention of photographing the eggs, but I found that they had hatched in the interim. After a careful search I saw two of the young birds running around the beach with the adults. I again checked up my identification to make doubly sure, and made a futile attempt to round up one of the young birds. They were too lively for me, however, and I gave up the attempt, for my time was limited.

Later in the day, July 23, we found a nesting colony of Black Terns on this same sandspit. We observed six or seven pairs at least; we found two nests each containing the characteristic three eggs, and we located two of the downy young swimming around among the sedgelike plants which grew in the shallow water at that point. We were fiercely assailed by the adults which often swooped within three feet of our heads in their desperate defense of the eggs. When we withdrew, the adults alighted on the nests and screamed after us.

Some of the adults were beginning to show the change to winter plumage, while others showed little if any white on the head and neck.

These birds showed almost no fear of us even when they were hunting some distance from their nests. Often they would wing their way within forty or fifty feet of us as we sat on the beach near the water's edge. The other water birds which we saw along the beach gave us a wide berth, swinging well out over the water to do so.—Franklin H. May, *730 Livingston Ave., Syracuse, N. Y.*

Breeding of Piping Plover in Lake Co., Ohio.—During the summer of 1917, I found a pair of Piping Plover (*Charadrius melodus*) breeding on a stretch of sandy beach at Lake Erie, and four young were successfully reared. This record was published in 'Wilson Bulletin' for September of that year. A search of the place during the five following seasons failed, for no birds spent the summer with us. However, on July 4, 1923, I again found a pair of birds with downy young running about; two of which were successfully raised to adult size.—E. A. Doolittle, *Painesville, Ohio.*

Occurrence of Buff-breasted Sandpiper in Lake Co., Ohio.—A lone Buff-breasted Sandpiper (*Tryngites subruficollis*) was found on the beach on August 19, 1923, in company with a bunch of sixteen Sanderlings and several small "Peeps." Visiting the place again next day I found all had departed but the Buff-breasted. Two opportunities of observation, with the absurd tameness of the bird, enabled me to note all characteristics of plumage and action. The bird would allow an approach to within eight or ten feet and then preferred to run a short distance, feeding the while,

rather than to take flight; and when purposely flushed for flight observations would return to the same place. The greenish legs, finely streaked crown, buffy breast and sides of head, lack of streak through eyes, and long pointed wings reaching beyond tail were all good field marks while the bird was at rest; while the lack of wing bars and rounded tail were striking when the bird took flight. However I was most interested in the bird's actions as it fed. One could gather from them that this was a bird of the fields rather than the beach. The large feet were lifted high at each step, as though stepping over and through the grass; and the legs, bent at the joints of tarsus and tibia, gave a Meadowlark-like crouch to his gait, as though moving and pushing aside the grass blades as he advanced. Also, every few feet he would straighten up as though peering above grass blades, and it was then I could see the decided resemblance, in the long neck and attitude, to a small Upland Plover. Another habit noted was that upon first being approached he would squat on the sand until he had looked me over, but would then get up and as often feed towards me as away from me. Besides being the only record of the species for Lake County of which I am aware, it is the twenty-fifth species of Shore Bird I have found on this particular stretch of beach.—E. A. Doolittle, *Painesville, Ohio.*

Whooping Crane in North Dakota.—In the 'Saturday Evening Post,' July 14, 1923, p. 48, an article was published by Hal G. Everts, entitled 'The Last Straggler.'

This article gives the records of several Whooping Cranes (*Grus americanus*) and graphically describes the death and disposition of what he calls "the last of its line," taken in Kansas in the fall of 1922.

Now, like many others, Mr. Everts was a little previous in his statement for my friend, Mr. Henry V. Williams, a taxidermist and ornithologist of many years' experience in the Red River Valley of North Dakota, saw, in the spring of 1923, two flocks of this rare species, one near Edinburg, Walsh County, North Dakota, with eight birds, and another flock of twelve in a slough farther west. Mr. Williams and his son have the finest collection of mounted birds of North Dakota in that state. Years ago they took Whooping Cranes, one of which I saw mounted in their shop in 1920. Mr. Williams published the above recent account in the 'Walsh County Record', published at Graften, North Dakota, July 11, 1923. We were glad to hear of so many still alive. I saw a flock of seven near Medina, North Dakota, in 1920.—Norman A. Wood, *Curator of Birds, Museum of Zoology, Ann Arbor, Michigan.*

Wood Ibis in New Jersey Again.—Last year it was my privilege to report a single Wood Ibis (*Mycteria americana*) sailing over Cape May Point, N. J., the first record for the state. Little did I think that the species would occur there again the next year but such is the case. On July 7, 1923, my friend Mr. David G. Baird informed me that he had seen two large birds with black and white wings which he thought must be

Wood Ibises, judging from my description of the bird seen the year before. They were flying over the marsh near South Cape May.

Accompanied by Mr. Baird and Mr. J. K. Potter I visited the spot as soon as possible, but it was not until we reached a large, shallow pond near the lighthouse at Cape May Point that we found them. There were four of them busily feeding in a sheltered spot partly surrounded by cattails. Their method of feeding was peculiar. They walked through the water and soft, oozy mud with the bill partly buried in it and the mandibles partly opened. Resting the weight of the body on one foot, the bird brought the other forward and shook the toes back and forth close to the bill, with the apparent intention of driving small fish or tadpoles between the mandibles. Then that foot would be planted firmly and the other one used in the same way on the other side of the bill. The birds frequented three ponds situated near together and roosted in low, dead trees near one of them. They were several times seen soaring in the air, all four together, far up above the Turkey Vultures. On these occasions they sometimes drifted more than five miles from their usual haunts. The birds were seen at frequent intervals from July 7 to August 21 and were apparently present continuously. During this period it was my pleasure to show them to a number of members of the Delaware Valley Ornithological Club and to Dr. A. K. Fisher of Washington, D. C. —Witmer Stone, *Academy of Natural Sciences, Philadelphia, Pa.*

A Nestling Red-shouldered Hawk's Hearty Meal.—On June 10, 1923, the writer took one of a brood of two Red-shouldered Hawks from a nest in a tall White Pine in a large tract of mixed woodland. The bird was well grown and quite well feathered, but could not fly although able to leave the nest and move about the branches of the nesting tree. Upon preparing the skin of the specimen, the stomach and gullet were found to be filled with food, an examination of which disclosed the following: A garter snake fifteen inches long; the head and about four inches of another snake of similar size; both hind legs of two frogs of good size; several small pieces of flesh probably of these frogs; a small turtle about the size of a silver dollar; three legs and the bill of Ruffed Grouse chicks; a large quantity of mouse hair mixed with green leaves. Assuming the above to be a normal meal, some idea may be obtained of the amount of food consumed by a brood of two or three of these hawks during the six weeks or more spent in the nest.

For identification of the Grouse tarsi I am indebted to the U. S. Biological Survey.—F. Seymour Hersey, *Taunton, Mass.*

Richardson's Owl in New York.—Definite records of the Richardson's Owl (*Cryptoglaux funerea richardsoni*) in New York state seem to be rare and I deem it of sufficient importance to record the taking of a female in a small open woods just south of Plattsburg, New York, on December 16, 1922. When first seen this Owl was perched about four feet from the

ground, on a small limb and against the trunk of a scrub pine. The situation was open and exposed and with no concealment except the blending of color with bark on the tree. It seemed very tame and permitted me to approach within a few feet before flying. The stomach contained the nearly digested remains of three mice. These skulls were identified by Dr. H. C. Oberholser as the Deer Mouse (*Peromyscus leocopus noveboracensis*). The thick feathers of this bird were well populated with fleas. I am no authority on insects but these seemed to me to be the same as the fleas commonly found on the Red Squirrel.—LIEUT. L. R. WOLFE, *26th U. S. Infantry, Plattsburg, N. Y.*

The Yellow-bellied Sapsucker in Philadelphia in August.—The Yellow-bellied Sapsucker (*Sphyrapicus varius varius*) is a common transient in Philadelphia, and arrives in the fall normally about September 22, according to my experience, consequently I was astonished to see one here on August 21, 1922, at Frankford. It was a female and perched for over a minute in plain sight on the trunk of a tulip tree, about fifteen feet up, and twenty feet distant, in the edge of a wood, by a road. There was a "wave" of Redstarts migrating at the time and I believe the Sapsucker came south with these Warblers as it followed them through the wood. It was the first Sapsucker I have ever seen here in August and exceeds my next record by almost a month.—RICHARD F. MILLER, *Philadelphia, Pa.*

Gray Kingbird in New Jersey.—The date of observation of the Gray Kingbird, at Cape May, N. J., was inadvertently omitted in the note published in the July 'Auk.' It was on the annual Memorial Day field trip of the Delaware Valley Ornithological Club, May 30, 1923. Dr. Witmer Stone informs me that he visited the spot on June 1, and frequently during July and August but saw no trace of the bird.—JULIAN K. POTTER, *Camden, N. J.*

Further Notes on the breeding of the Starling (Sturnus vulgaris) at Hatley, Que.—In my previous note 'Auk,' Vol. XL, 1923, p. 539, the pair of birds there recorded were still feeding their young on the last of the dates mentioned, viz.: May 31, 1923. This they continued to do until June 4, when the young left the nest. Two days later I was surprised to see the parents again taking building material to the old nest and by the 28th they were busy feeding their second brood. This brood left the nest early in the morning of July 16, the parents gathering food off my lawn and feeding their offspring, which were in the trees opposite the house. Early in June, I was told by Mr. G. P. Hitchcock of Massawippi, that he had seen six birds during the spring and that a pair had nested in his barn. On the 6th of the month, I myself saw a pair of birds near this same village (which is three miles from Hatley), carrying food to their young, the nest being situated in the hole of a large poplar tree, standing on the road side near a farm house. From five to seven pale blue eggs are laid, and a case

similar to that of the Flicker (*Colaptes auratus luteus*) is on record, where a bird laid as many as forty eggs, the recorder persistently removing one egg a day from the nest. The Starling is not regularly double brooded, but often a second brood is reared, and eggs dropped by the impetuous bird are not uncommon as well as cases of its breeding out of season. In England the status of the Starling is complicated, some of the birds being residents, but others leave in the autumn to return in the spring as summer visitants, whilst numbers from the north and east of Europe winter there, and some travelling further south (to northern Africa probably) are birds of passage only. What the exact status of the Starling in Canada will be is still doubtful. Will it become a resident in those parts where the winters are comparatively mild, and a migrant in those such as Hatley where the winters as a rule are vigorous, with the thermometer often dropping to 30°, or more, below zero? Time alone will tell, but personally I should not be at all surprised to find that, like the English Sparrow, it becomes acclimatized to withstand even the coldest winters, in which case we shall have it always with us. As I conclude this note, I see from 'Bird-Lore,' Vol. XXV, 1923, No. 4, p. 249, which has just come to hand (Aug. 3), that a pair of Starlings have bred this year at Port Dover, Ontario, making their nest in a hole in the side of a flour mill, and had two young, according to Mr. F. A. Barwick of Toronto, Ont.—Henry Mousley, *Hatley, Que.*

Yellow-headed Blackbird in Vermont.—Some time ago a friend of mine, Mr. Henry S. Wardner of Windsor, Vermont, told me of his having seen a Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) several years before at that place. At the time, he could not remember the exact date, but promised to send it to me. The following is quoted from letters recently received from him regarding this occurrence:

"At Windsor, Vermont, on Sunday, August 27, 1916, I was confined to my bed-room by illness. Between the hours of eight A. M. and noon of that day I heard through the open windows what I believed was the call of a bird. The note was unfamiliar to me. It was repeated several times, and seemed to proceed from a clump of trees below and to the easterly of my house, and about one hundred yards distant. I looked in that direction but saw nothing strange. As a matter of fact the view was pretty well blocked by the leaves of a large sugar maple which stands near the northeast corner of my house.

"Some minutes later I heard the same cry near my room. I got out of bed, looked from my north window, and saw within about twenty feet from where I stood or sat, and about on a level with my eyes, a Yellow-headed Blackbird. He was moving restlessly from branch to branch in an English mountain ash. He seemed nervous and irritated because of the presence of other birds. These last—I do not recall whether they were Song Sparrows or some other common birds—to the number of four or five, seemed to regard the Yellow-headed Blackbird as a curiosity or possibly as a menace. They did not attack him while I was looking on.

"My wife saw the bird also from the same window and remarked on his colors. He remained in the mountain ash several minutes. I never saw him again, and have never heard that anybody else, other than my wife, saw him. I speak of him as a male. His plumage was very bright, and, of course, striking."

" . . . I saw him in a great many different positions and he was near. With a view to checking up my own observation I called my wife to look at him and to describe to me his plumage. This was for the purpose of making the proof complete. She repeated the colors exactly as they looked to me. There can be no mistake in regard to them. . . "

Mr. Wardner is a very keen observer, always interested in birds, and there can be no doubt of the identification.—FRED H. KENNARD, *Newton Centre, Mass.*

Courting Orioles and Blackbirds from the Female Bird's Eye-view.—In 1923 the Baltimore Orioles arrived in Lexington, Mass., on on May 13; a few days later I noted the following courting action:

A male Baltimore Oriole (*Icterus galbula*) of strikingly brilliant plumage was singing loudly in a maple tree when a female Oriole took a long flight and alighted in the same tree. The male flew to her, placed himself directly before her, facing her at a distance of a few inches and here struck successively two attitudes; in one his body was nearly upright, straight and tall, in the other it was bowed downward and forward with the head at the level of the feet. The wings were held closely at the sides. In passing quickly from one attitude to the other, over and over again, he moved up and down with a sharp jerk, rather than in an easy sweeping motion, and he made a very short pause each time before changing direction.

This is a very simple motion, one may say—just an exaggerated bowing—not very different from the bowing, nodding, or swaying of many birds in the excitement of their courting displays. True enough, and it is not until we look at the action from the point of vantage of the female bird and see in our mind's eye, as nearly as we can, just what she sees, that we understand its significance.

In the first position noted above, the orange of the breast glows before her, and so near her that it fills a wide arc with blazing color. Then, as the male bird bends swiftly forward, and the head comes down, the orange is blotted out by black, as by a camera shutter, and immediately, as the bird continues to bend forward, out flashes the orange color again, now on the rump. Witnessed at close quarters, the appearance of this maneuver must be as the bursting out of a great sheet of flame, its instantaneous extinction into darkness, a flaring up again,—then darkness once more.

How different the courting of the Red-winged Blackbird! He makes good use of his ornamented wings, as the following notes show:

Late in May, 1915, I saw a male Red-winged Blackbird (*Agelaius phoeniceus phoeniceus*) paying vigorous attention to a female. She was on the ground; the male either on the ground or very near it. He faced

her with his wings partly spread and, although I was immediately in front of him, I could see practically the whole of his shoulder-patches. That the feathers forming the patch were elevated, I am almost sure, for if they had laid flat I could not have seen all of them unless the shoulders had been lowered and the tips of the wings somewhat raised,—and the wings were not in this position. Even from a distance of 50 or 75 yards the display of brilliant color was almost startling,—it seemed impossible that a Blackbird could make such a gorgeous show—but to the female viewing the display from only a foot away, it must have been dazzling —half the sky must have been shut out by fire.

That this display by the male of his secondary sexual characters constituted an actual courting maneuver was proved by the immediately subsequent action of the pair.

The Cowbird (*Molothrus ater ater*), like the Oriole, bows before the female; also like the Oriole his head is of a different color from his rump and breast. No great contrast to be sure—black and coffee-color—but perhaps by bowing for countless generations the head will take on a more brilliant color and the species will thereby gain finally as sharp a contrast as the Baltimore Oriole possesses now.—Winsor M. Tyler, *Lexington, Mass.*

A Blue Grosbeak Family in Southern Pennsylvania.—The finding of a family of Blue Grosbeaks (*Guiraca caerulea caerulea*) on the line between Lancaster and Chester Counties as a matter of rare interest reaches beyond the ornithological circles of the immediate region. The accumulated evidence of a line of expert observers in Chester County since Townsend's day has produced only two or three records of the bird as a straggler there. About a hundred and twenty-five years ago John Bartram, the famous Philadelphia naturalist, reported the Blue Grosbeak as a summer resident of Lancaster County. The local bird students of the fifties and sixties seem to have listed the Grosbeak among the Lancaster County birds almost solely on Bartram's authority. To those of to-day the species had become little more than a passing tradition.

Clifford Marburger and I went to the Barrens of southern Lancaster County on July 12, 1923, to find the Prairie Warbler which we thought might be nesting there. A belt of serpentine extending into this part of the county from Chester County and nearby Maryland produces a soil of such thinness that the region resembles the New Jersey Pine Barrens in its sparse growth of post and barren ground oaks, pitch pine and red cedar.

We were working along the edge of the Barrens at the county line—the Octoraro Creek, when out of the evening bird chorus we caught a new voice. Fairly strong, clear and melodic, the song had in it the sprightly tones of the Indigo Bunting curiously combined with the softer warble of the Bluebird. A little cautious maneuvering and we had the songster in the fields of our binoculars. He was singing with head back and bill

straight upward—a thick-set bird about seven inches long. The light was failing fast but it was bright enough to show us something that quickened our interest—a massive slaty blue bill. We followed the restless bird to some low bushes and then, at a distance of ten yards, with my Zeiss 8 × 40, I had the sight and thrill of my ornithological life time.

There were—in the clear round field at one time—four birds: A male Blue Grosbeak, he of the slaty blue bill, dull grayish brown above, and below, with red-brown shoulder marks and indistinct blue on the lower back and tail coverts; his mate—similar in stocky build, heavy bill and notched tail, but with solid, sooty back and yellowish-buff throat and breast; a Towhee, perhaps attracted by the nervous chirping of the Grosbeaks; and only for a few seconds, but long enough to show one the diagnostic black line on the yellow side below the wing—a female Prairie Warbler. Then twilight deepened and we went to headquarters—hot, a bit catbriar scratched, but happy.

The discovery of something new or rare in nature brings to some men an inrush of joy which is permanent in its effect and establishes a craving. Only he who has been as fortunate as I was in my little rediscovery of the Blue Grosbeak can understand that it is the benign potency of this craving which made Audubon master of hardship and disappointment, and which has taken thousands into the open in heat and cold humbly and without reward to weave the beautiful fabric of American Ornithology.

The next morning we were out at four thirty. We hoped to find the nest of the Grosbeaks though we knew the season was against us in this. We were too late. But the pair were where we had left them the night before and in the bright morning light gave us ample opportunity to reestablish the very great indistinctness of the blue on the male and to settle the fact in our minds that next to the bill the best field mark on the male is the reddish shoulder. And the young were there too, for we soon discovered the droll, dull-colored, stump-tailed birds, barely able to fly, about which the Grosbeaks were making so much fuss.

Which after all was just as good for our purposes as finding the nest; for quite as certainly, after a century and a quarter of doubt, we had modestly supported the testimony of John Bartram and placed the Blue Grosbeak back on the list of Lancaster County's summer residents.—HERBERT H. BECK, *Franklin and Marshall College, Lancaster, Pa.*

Western Tanager in Texas.—Nearly all of June I spent in Dallas, Texas, at the home of Mr. R. A. Gilliam, who has a beautiful estate in the suburbs. He has about ten acres of wooded land, and five of lawns, gardens, etc. About thirty species of birds nest on his place, and I spent a good deal of time wandering about and identifying these birds, many of which were new to me.

The first week in June I heard a strange song and following it up found the bird and examined it closely both with and without a glass, having a splendid opportunity to study it closely. It was a Western Tanager,

(*Piranga ludoviciana*) and I saw it several times during the month, and learned its song well.—Alice B. Harrington, *Lincoln, Mass.*

Bay-breasted Warbler a Regular Summer Resident on Mount Monadnock, N. H.—In the 'Bulletin of the Essex County Ornithological Club' for 1922, pp. 23–26, the writer presented evidence strongly indicating that the Bay-breasted Warbler (*Dendroica castanea*) nests in the spruces on Monadnock mountain in southern New Hampshire at an elevation of approximately 1400 feet, although no nest of this species has been discovered there. The observations were made during the years 1921 and 1922.

On July 4, 1923, Mrs. Whittle and I again spent a half day in the same locality where we had seen three Bay-breasts previously. This visit dissipated such slight doubt as we had previously entertained regarding the status of the birds as four different adult males were seen and heard singing while a fifth male was heard nearby. Two males seen at short range, ten to fifty feet distant, were accompanied by their mates and were busy carrying food into the fringe of small spruces bordering a larger growth, no doubt to their young, the nearness of which, in the case of one pair, was painfully shown by the great concern manifested by the parent birds, particularly the female. We did not, however, have time to find either the nests or the young. A more thorough examination of the spruce area in question would doubtless have discovered more nesting Baybreasts.

The finding of this species three years in succession at nesting time and in such abundance proves it to be a regular summer resident on the mountain. That more were not seen by us in previous years does not mean that others were not present, for during the first two years our attention was focused on a particular spot, no part of the remaining spruce tract being examined.

We thus have this member of the Canadian Fauna firmly established on an isolated mountain which rises 3166 feet above the sea and is separated from the nearest mountain, approaching it in altitude, by a distance of twelve miles. Their occurrence here is of course attributable to the altitude which permits the growth of solid patches of red spruce, often having a border of small trees of the same species, in which the birds love to nest. I am unable to state at this time the exact area covered by the spruces, but it is planned to secure this information and to study the birds more thoroughly another year.

In this patch of evergreens the Bay-breasts occur in such numbers as to perhaps constitute a colony, and it is of interest to note that as long as the present distribution of conifers and deciduous trees is maintained, this group of birds will be able to enjoy complete isolation during nesting time.—Charles L. Whittle, *Cohasset, Mass.*

Early Migratory Movements of Seiurus n. noveboracensis.—On July 2, 1923, at 6.05 A. M., there came to our banding station in Peterboro,

N. H., a Water-Thrush (*S. noveboracensis*). This bird remained close about the house for nearly an hour and then was seen no more. It was banded during its stay. The plumage was notably fresh and unworn but did not give evidence to us of being a bird of the year. The early date was interesting. We have never found the Water-Thrush during the breeding season in the Peterboro region, but Mr. Gerald Thayer reports it "a local and uncommon summer resident about Monadnock's northern base, haunting some of the deep woodland bogs . . . and . . . a few of brooks." The northern base of Monadnock is about ten miles from our station, and a little north of west, in direction.

Strangely enough on July 7, 1923, at 6.15 A. M., another Water-Thrush visited our banding station in Cohasset, Mass., twenty miles southeast of Boston, on the South Shore; and on July 7, 1923, between 6 and 7 A. M., a third individual came to the Peterboro station. The second and third birds remained only a few moments, in each case. They were perhaps attracted to the traps by the freshly raked earth, free of vegetation, upon which the traps rest. All three dates were fair mornings following rain, when birds in general were especially active—such mornings as commonly, later in the season, bring south-bound migrants.—Helen Granger Whittle, *Peterboro, N. H.*

Short-billed Marsh Wren at Waterford, N. Y.—During the entire summer of 1922, a male Short-billed Marsh Wren (*Cistothorus stellaris*) was singing in a small, almost dry slough at Waterford, N. Y. No female was seen and no evidence of a nest was found. The bird was seen many times with eight power glasses and was heard in frequent song. A nest and set of eggs was taken many years ago at Green Island—only two miles away—and it is now in the Smithsonian Institution at Washington.

This is probably the first record for Saratoga County and that the bird was merely a vagrant is proved by its absence in 1923 as well as prior to 1922.—Edgar Bedell, *Waterford, N. Y.*

Some Recent Records for British Columbia.—All of these records were made in the Osoyoos district, the extreme southern portion of the Okanagan Valley, just north of the boundary between British Columbia and Washington State, while on a collecting trip with P. A. Taverner and H. M. Laing in the spring of 1922. Osoyoos is in the arid interior east of the Cascade range.

Steganopus tricolor. Wilson's Phalerope.—As the status of this species for British Columbia rested solely on a sight record made in 1889, it gave me great satisfaction to meet with the species again and to place it on the Provincial list over unquestionable evidence. A single male was taken near the north end of Osoyoos Lake on May 15, and the female of a pair on May 18. I refrained from shooting the male of this pair in the hopes that the mate of the first male was in the neighborhood. The

condition of the ovary in the female indicated that the first egg would have been laid within a week, so this may be taken as a breeding record.

Archibuteo ferrugineus. FERRUGINOUS ROUGH-LEG.—An adult of the ordinary light colored type was seen at Osoyoos twice on April 28 under circumstances that left no doubt whatever in my mind as to its identity, the bird being within one hundred yards and carefully scrutinized in a good light with an eight power glass; all its very distinctive markings were noted. Another in the melanistic phase was seen several times on May 22. It is highly probable this hawk breeds in the vicinity. This is the first record of its occurrence in British Columbia.

Falco columbarius suckleyi. BLACK MERLIN.—A fine adult male Black Merlin was taken in the foothills east of Oliver, some fifteen miles north of Osoyoos Lake, by P. A. Taverner, June 10. Although the condition of the organs showed that this was a non-breeding bird its occurrence in the breeding season in the territory occupied by the pale subspecies of the Pigeon Hawk, *Falco columbarius bendirei*, recently described by Kirke Swann, is notable. The specimen, now in the collection of the Victoria Memorial Museum at Ottawa, is a typical *suckleyi* with the markings on the inner webs of the primaries reduced to small isolated spots.

Spiza americana. DICKCISSEL.—A singing male was taken by P. A. Taverner at an alfalfa field on the eastern shore of Vaseaux Lake, in the southern Okanagan Valley, on June 12, 1922; the sexual organs were extremely large. A bird which was obviously its mate came out of some brush within a few yards and peered at Mr. Taverner as he was putting up the specimen; this points to a breeding station. The record is some eight hundred miles further west than the previous western record in northeastern Wyoming, and is the first instance of the occurrence of the species west of the mountains.

I am indebted to Mr. Taverner for the privilege of publishing these last two records.—ALLAN BROOKS, *Museum of Vertebrate Zoology, Berkeley, California.*

Winter Visitors at Lawrence, Kansas.—On March 18, 1923, Lawrence, Kansas, experienced a rather severe storm. The temperature dropped to near zero and a fine snow was driven about by a strong north wind, proving a great hardship to the birds. Some 450 Robins (*Planesticus migratorius migratorius*) and 35 or 40 Cedar Waxwings (*Bombycilla cedrorum*) congregated about the buildings at Haskell Institute. As would be expected the Waxwings seemed much more able to withstand the storm than did the Robins, for they remained in the hackberry trees directly in the teeth of the storm. The Robins on the other hand sought the shelter of the buildings, clinging to the Virginia creeper (*Ampelopsis quinquefolia*), aligning themselves along the base of the wall on the south and along a cement walk which served as a cover for a steam tunnel. They seemed very thirsty; as many as could crowded about the little puddles of snow water on the warm cement, drank greedily and remained to enjoy

the warmth. A few of the Waxwings also took advantage of the chance to drink but did not tarry long after quenching their thirst.

The most interesting differences between the two birds were to be noted in their manner of feeding. Hackberries (*Celtis occidentalis*) being the only available food and then only on the tips of the smallest twigs, having been eaten long before within reach of the twigs large enough to serve as perches, it was necessary for the birds to take the food on the wing and the Robins seemed to be at a great disadvantage. With head to the wind the Robins would flutter up until the bill almost touched the berry, meanwhile holding the head motionless, and finally after several attempts securing the berry. The Waxwing would hover about the twig tips with apparent ease, and from one position twist the head and extend the neck reaching several berries. Both the benumbing effect of the cold and the unnatural manner of taking food undoubtedly handicapped the Robins. At any rate they had more difficulty in maintaining their position about the twig tips by hovering and poorer use of the head and neck in grasping the berries while on the wing than did the Waxwings. Also when perched in a windy situation the Robins maintained their positions only with many wing-beats and wide spread tail while the Waxwings sat in the face of the wind with closed tail and scarcely a wing-beat.

Last fall's hackberry crop was an unusually heavy one and served as the principal food of the large flocks of Cedar Waxwings which spent the winter with us. Large flocks of Red-headed Woodpeckers (*Melanerpes erythrocephalus*) also remained throughout the winter feeding on the berries. Never before in the past four winters spent at Lawrence have I found the Red-headed Woodpecker remaining throughout the winter and I believe that their stay in such large numbers the past winter was due mainly to the abundant food supply. The winter was less severe than usual, too. —E. R. Hall, *University Museum, Lawrence, Kansas.*

RECENT LITERATURE.

Bent's 'Life Histories of North American Wild Fowl.'[1]—The first part of Mr. Bent's 'Life Histories' of the Ducks, Geese, etc., is well up to the standard established in the preceding 'Life Histories' and, as in those volumes, the reader is amazed at the vast amount of material that the author has assembled and the extent of the research required to bring it together.

The species covered in the present volume are the Mergansers and the Ducks from *Anas* to *Marila* inclusive, in the order of the A. O. U. 'Check-List,' which has been followed, even though the nomenclature has not.

[1] Life Histories of North American Wild Fowl. Order Anseres (Part). By Arthur Cleveland Bent, of Taunton, Massachusetts. U. S. Nat. Mus. Bulletin 126. Washington, 1923, pp. i–ix + 1–250, pll. 1–46.

The various Old World forms recently added to the fauna, mainly in the far northwest have been interpolated where they are considered to belong. Curiously enough, although the author emphasizes the close relationship between the Ring-necked Duck and the Tufted Duck, also pointed out by Hollister, he places them in different genera separated by the Scaups! However he is evidently not responsible for this arrangement as he has transferred all authority for the scientific nomenclature of his work to Dr. Charles W. Richmond and Dr. Harry C. Oberholser (introduction p. 6), and his opposition to a multiplicity of genera is well known (see 'Auk', 1923, p. 180). He has, however, a comment on nomenclature on p. 64 when he says of the complicated history of the Black Duck, "Our old friend was hardly recognizable after all the changes; fortunately we can still call him by the old familiar name, the Black Duck. Let us be thankful for the much-needed stability in the English names." To this we would say amen! and trust that those who have been advocating changes in the English names will take heed. Indeed we regret that Mr. Bent did not omit the Latin names entirely, for they seem to serve no purpose whatever in a work of this kind.

The birds of which our author treats in this volume are species which have from the earliest times attracted man's attention and their life histories, so admirably told, will furnish most entertaining reading to numbers of sportsmen and nature lovers to whom the rarer and unfamiliar birds of the sea in the earlier 'Life Histories' had less appeal. These readers will make a large addition to the ornithologists who value all the volumes equally as works of reference, and we hope the edition has been made adequate to meet this need. Let all those who can do so respond to Mr. Bent's appeal for help and send him information on species far along on the list so that he may have adequate data to draw upon when the time comes.—W. S.

Preble and McAtee on the Birds of the Pribilof Islands.[1]—This report is based on observations made by the senior author on a visit to the islands in 1914 as a member of the Fur Seal Commission, as well as data and collections obtained by others, notably by W. L. Hahn and G. Dallas Hanna, and the late William Palmer's painstaking report published in 1899 which up to the present time has been "the only completely annotated list of the birds of the group." Mr. Preble is responsible for the general accounts and Mr. McAtee for the data on food, based largely on personal analysis of stomach contents furnished by various collectors. The result is an unusually complete series of data on the various species, covering habits, abundance, migration, nesting and food, and forming a most important work of reference.

[1] North American Fauna, No. 46. A Biological Survey of the Pribilof Islands, Alaska. I. Birds and Mammals. By Edward A. Preble and W. L. McAtee. II. Insects, Arachnids and Chilopods. By various Entomologists with an Introduction by W. L. McAtee. June 20, 1923. Birds, pp. 1–101, pll. 2–6.

Mr. Preble discusses the life zone relationships of the group, which is of course most closely allied to the Arctic but "there are many elements that forbid its unqualified reference to that zone." The small size and rugged contour of the islands, severe winds, isolation and abundant food supply have combined to produce a fauna and flora peculiar in many respects.

No less than 137 species of birds are now known from the Pribilofs of which twenty-three breed. There are also seventeen regular migrants, and six of less regular occurrence, while the rest of the list is made up of species that have occurred only as occasional visitors, many of them but once, of these no less than twenty-one are visitors from Eurasia.

The authors are to be commended for giving footnote equivalents to the A. O. U. 'Check-List' so that those not conversant with the various new genera recently proposed may understand to what the names refer. There is a growing tendency especially in Government ornithological publications among those using "up to the minute" nomenclature, that has not been accepted in the A. O. U. 'Check-List' or other standard lists, to give no clue to where the new names originated or in what sense they are used. Even trained ornithologists cannot ascertain these facts without much laborious research, whereas a word of explanation or a footnote reference as here used would supply the clue.

Messrs. Preble and McAtee are to be congratulated upon producing a valuable contribution to American ornithology.—W. S.

Miss Cooke on Bird Censuses.[1]—This interesting report summarizes the history and results of the bird census work conducted by correspondents of the U. S. Biological Survey from 1916 to 1920.

The object of bird censuses is to ascertain as accurately as possible the number of breeding birds in selected areas. The counting of singing males at the height of the nesting season is the most satisfactory method and about 80 acres seems to be the area best suited for a single observer, provided it includes reasonably diversified country. The count should be made several times as a check on its accuracy. From the data so far obtained, fragmentary as it is, it has been possible to draw some fairly accurate conclusions. In the northeastern States, for example, the average bird population per 100 acres for the four years 1916, 1917, 1918 and 1920 was respectively 159, 124, 95 and 140 pairs and for the north central States, 139, 129, 150 and 124 pairs. In the northeastern States the Robin proves to be the most abundant, comprising 8.3 per cent of the bird population, Song Sparrow, 7.7; English Sparrow, 4.3; Chipping Sparrow, 3.9; Catbird, 1.7; and Meadowlark, 1.0.

In the north central States the order of abundance differed: English

[1] Report of Bird Censuses in the United States, 1916 to 1920. By May Thatcher Cooke, Assistant in Biological Investigations. Bureau of Biological Survey, U. S. Dept. Agriculture; Dept. Bull. 1165. July 20, 1923, pp. 1–34, 10 tables. Price 5 cts. Supt. Documents, Gov't. Printing Office, Washington, D. C.

Sparrow, 8.7 per cent; Robin, 6.2; Meadowlark, 4.0; Song Sparrow, 2.8; Catbird, 2.5; and Chipping Sparrow, 1.5.

While no doubt subject to future correction these illustrations show the possibilities of this line of work while a series of yearly counts of a single area will show the increase or decrease of given species, and the tabulation of many such records will show whether this is local or general.

As the author points out, censuses, to be of any value at all, must be made by experienced observers capable of identifying every species in the area. Censuses containing only a few species of those known to be present, unlike similar migration reports, are useless. So while migration work may be undertaken by those familiar at the start with but half a dozen species, census taking is a task for the trained ornithologist. There are many detailed accounts of censuses in various parts of the country which prove interesting reading.—W. S.

Mathews' 'Birds of Australia.'[1]—Three parts of this work have appeared since our last issue. Parts 6 and 7 of Volume X complete the Cractidae, and the latter contains the title page, contents and index for the volume. There appear to be no new forms proposed in these parts. Mr. Mathews states in the preface that the close of the work is now in sight, as the manuscript is completed.

The remaining part is entitled "Supplement No. 2," and comprises the second instalment of the author's 'Check-List' of Australian birds covering the Pittidae to Sylviidae inclusive, with four pages of corrections to part one and a bibliographic appendix covering 1907-1921.—W. S.

Witherby's 'Handbook of British Birds.'[2]—Part XVII of this excellent work completes the Gulls and covers the Skuas and part of the Auks. The plumages are considered in much detail with the aid of several plates and numerous text cuts, one of the former being devoted to the downy young and another to Gulls in flight, all with wings similarly extended so that a comparison of color pattern can be made.

The pointed and rounded central tail-feathers of the Razor-bill and Brunnich's Murre are well contrasted, an important point since misidentifications of these birds are frequently made.

The substitution of the name "Wedge-tailed Gull" for "Rosy Gull" does not seem warranted, as changes in English names should be avoided wherever possible.—W. S.

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[1] The Birds of Australia. By Gregory M. Mathews, Vol. X, No. 6, June 5, 1923; No. 7, July 26, 1923; Supplement No. 2. 'Check-List,' Part 2. July 26, 1923.

[2] A Practical Handbook of British Birds Edited by H. F. Witherby. Part XVII, June 28, 1923. Price 4s 6d per part. H. F. & G. Witherby, 326 High Holborn W. C. 1, London.

Bibliography of Austrian Ornithology.[1]—Tschusi Zu Schmidhoffen has published his usual bibliographies of ornithological literature for Austro-Hungary for the years 1915 to 1918 inclusive, which form valuable reference lists for those studying the birds of central Europe.—W. S.

Oberholser on New East Indian Birds.[2]—This paper is the result of further studies of the rich collections made by Dr. W. L. Abbott in the East Indies and most of the nineteen new subspecies are described from specimens collected by him. They represent the families Turdidae, Sylviidae, Pycnonotidae, and Muscicapidae. The descriptions are full and in every way model diagnoses.—W. S.

Wetmore on New Patagonian Birds.[3]—Four new forms are here described. Three from the collections of the U. S. National Museum and one from the Pemberton collection deposited in the Museum of Vertebrate Zoology, University of California. The study of the latter led to the recognition of these new forms which the author has named: *Pteroptochos rubecula nemorivaga* (p. 333), Port Otway, Sts. of Magellan; *Taenioptera pyrope ignea* (p. 334), Lareda Bay, Sts. of Magellan; *Turdus magellanicus pembertoni* (p. 335), Rio Negro, Argentina, and *Spizitornis parulus lippus* (p. 336), Owens Islands, Chile.

The complications of modern nomenclature make it absolutely impossible to determine whether Dr. Wetmore in using *Turdus* regards the old genus "*Merula*" as congeneric with the typical Thrushes or whether he desires to be "up to the minute" in his use of names. Thus is the lessened usefulness of technical names emphasized unless some explanation is added!—W. S.

Jones on Inheritance in Pigeons and Fowls.[4]—Miss Jones has published two papers bearing upon the inheritance of plumage characters. In one she discusses the several interacting factors which produce varying amounts of black and blue color in pigeons. She finds five factors affecting distribution of black pigment, producing (1) black in the wing bars, (2) black sprinkling in the wing coverts, (3) black check pattern, (4) black throughout the wing coverts and (5) black tail. The detailed discussion is mainly of interest to students of evolution and is in the complicated terminology of modern genetics, but some of the conclusions are of importance to the systematist.

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[1] Ornithologische Literatur des früheren Österreich-Ungarns 1915. Verhandl. k. k. zool.-bot. Gesellshaft in Wien, 1916; same for 1916, ibid 1918; same for 1917 and 1918, ibid 1921.

[2] Descriptions of New East Indian Birds of the Families Turdidae, Sylviidae, Pycnonotidae and Muscicapidae. Smithson. Misc. Collns. Vol. 76, No. 6. July 16, 1923, pp. 1–9.

[3] New Subspecies of Birds from Patagonia. By Alexander Wetmore. Univ. of Calif. Publ. in Zoology. Vol. 21, No. 12, pp. 333–337, June 16, 1923.

[4] Studies on Inheritance in Pigeons. IV. Checks and Bars and Other Mutations of Black. By Sarah van Hoosen Jones. Genetics 7, 466–500, September, 1922. Inheritance of Silkiness in Fowls. By Sarah van Hoosen Jones. Jour. of Heredity, XII, No. 3; March, 1921, pp. 117–128.

For example, the author states that as a result of the isolation of some of these factors it seems evident that certain species differences are based on a single factor. Therefore she contends that "if such marks are used for species differentiation, then the color variations of each variety of the various breeds of pigeons might as legitimately be assigned species names." This of course brings up again the old question: What is a species? and it is quite conceivable that it is one thing from the point of view of the geneticist and another from that of the systematist. The latter, as we understand it, is dealing with forms as they occur in nature, and those which remain constantly different even though by a single factor are none the less species. The artificially produced forms due to selective breeding may differ more widely from one another but if when thrown back on nature they all revert to an original type they are not species from the systematist's point of view.

The possibility that the Domestic Pigeon is of polyphyletic origin and not descended from a single species *Columba livia*, we are quite willing to admit.

The second paper deals with the inheritance of silkiness in fowls, a plumage condition due to lack of hooks on the barbules. The author considers that the sporadic occurrence of such birds, which has been noted since the thirteenth century, is due to the chance mating of birds carrying the silky factor in heterozygous condition.—W. S.

Howell on Agencies which Govern the Distribution of Life.[1]—This is an interesting and readible discussion of an important subject which has engaged the attention of many students. Mr. Howell, while conceding that temperature is the most important factor involved, believes that too little attention has been given to other agencies, some of which he considers. His classified table of 'Agencies' contains five main heads: (I) Life Types, whether active, or sedentary, aquatic, fossinal, etc.; (II) Direct Physical Barriers, oceans, rivers, mountains, etc., forests, plains, and deserts; (III) Regulation by Temperature, zonal, faunal and associational; (IV) Food and (V) Enemies.—W. S.

Chapman on New Formicariidae and Dendrocolaptidae.—A continuance of the study of his SouthAmerican collections has resulted in the discovery of twenty-two new forms of these difficult families which Dr. Chapman names in the paper before us. They belong to the genera *Thamnophilus, Myrmotherula, Microbates, Myrmoderus, Hylophylax, Grallaria, Schizoeaca, Synallaxis, Siptornis, Pseudocolaptes, Philydor, Xenopicus, Xenops, Sclerurus Glyphorhynchus* and *Lepidocolaptes*.

The descriptions are full with lists of specimens examined and comments on related forms, measurements, etc.—W. S.

[1] Agencies which Govern the Distribution of Life. American Naturalist, LVI, Sept.-Oct., 1922, pp. 428–438.

Allen's 'Winter Birds—A Bird Masque.'[1]—This attractively illustrated little pamphlet presents a bird masque in three acts intended to portray winter feeding. It will prove of great interest to schools and other organizations which desire to stage small plays or masques and carries a convincing lesson in bird conservation.—W. S.

Meinertzhagen's 'Review of Oriolus.'[2]—The author presents in this paper a complete list of the species and subspecies of the Old World Orioles, with important synonymy, comparative descriptions, distribution, etc. He rejects the genus *Mimeta* as not distinct from *Oriolus* but regards it as the primitive group from which sprang the Golden Orioles on the one hand and the Maroon Orioles on the other.

Col. Meinertzhagen admits twenty species, with forty-nine additional subspecies or sixty-nine forms in all, while Sharpe's 'Hand-List' (1909) recognizes sixty-four, and the British Museum Catalogue (1877) but thirty-three.—W. S.

Pennsylvania Audubon Bulletin.—The Audubon Society of Western Pennsylvania has published its first 'Bulletin' dated April, 1923. It contains a list of winter birds of the region by Geo. M. Sutton, an article on Crossbills by Bayard H. Christy, on the Great Horned Owl by S. S. Dickey, and on the Purple Martin by J. W. Jacobs with many notes on bird study and conservation. It is a well printed and attractively illustrated brochure.—W. S.

The Ornithological Journals.

Bird-Lore. XXV, No. 3, May–June, 1923.

The Common Loon. By Robert J. Sim.—An admirable study of the bird and its nesting with photographs and a drawing by the author.

Stories from Birdcraft Sanctuary. IV. Ducks and Drakes. By Mabel Osgood Wright.—Nesting of Mallard.

Spring Visitors to a Pasadena Garden. By Ada Wilson.

Daisy Fields in June. By A. A. Allen.—Illustrated by beautiful photographs of Meadowlark, Vesper, Henslow's and Savannah Sparrows, Prairie Horned Lark and Bobolink, and their nests. The Educational Leaflet treats of the Louisiana and Night Herons.

Bird-Lore. XXV, No. 4. July–August, 1923.

Audubon's Farm. By Mary W. Daley.—A visit to "Fatland Ford."

How the Killdeer came to Southport. By Milton S. Lacey.

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[1] Winter Brids. A Bird Masque in Three Acts to Portray Winter Feeding. By Elar Guerdrum Allen. Reprinted from Nature Study Review, May, 1923, pp. 1–19. Comstock Publishing Co., Ithaca, N. Y.

[2] A Review of the Genus Oriolus. By Col. R. Meinertzhagen. The Ibis, January, 1923, pp. 52–96.

Ruffed Grouse. By Thos. A. Taper.

Migration records treat of the Bullock's and Hooded Oriole.

August Shores. By A. A. Allen is a splendidly illustrated account of the Shore birds.

The Condor. XXV, No. 3. May–June, 1923

Nesting Records of the Dusky Poor-will. By Joseph Dixon.—With admirable illustrations from photographs.

A Little Known Ornithological Journal and its Editor, Adolphe Boucard, 1839–1904. By C. A. Kofoid.—An account of the life of this interesting ornithologist who spent a year, 1851–1852, in San Francisco, together with a bibliography of his journal 'The Hummingbird.'

Observations on the Habits of the Prairie Falcon. By John G. Tyler.

The Boy who Hunts. By R. C. Ross.—Advocates stalking as a substitute for killing.

A Letter from T. M. Brewer to Osbert Salvin. By Casey A. Wood.

Notes on Birds of Southwest Saskatchewan. By L. B. Potter.

The Migration of the King Eider at Syonuk, Alaska. By Grace A. Hill.

Bird Records from Craig, Alaska. By G. Willett.

The Condor. XXV, No. 4. July August, 1923.

Definite Breeding Record for the Aleutian Tern in Southern Alaska By E. P. Walker.—Near Yakutat.

Notes on the Song and the Nest of the Ruby-crowned Kinglet. By Winton Weydemeyer.

Banded Birds: A Graphic Form of Record for Repeats. By J. E. Law.

Some Unusual Nesting Sites of Several Arizona Birds. By F. C. Willard.

How is this for Conservation of Wild Life? By Joseph Mailliard.—Criticises liberation of goats on small tropical islands as they destroy the vegetation.

Additional Notes from the Coastal Islands of Southern California. By D. R. Dickey and A. J. van Rossem.

Animal Aggregations: A Request for Information. By W. C. Allee.—The writer asks whether bird flocks are the result of family gatherings or independent of family lines? also what is the behavior of a bird as a member of a flock and as an isolated individual? It is pretty well proven that in migration adults and young migrate separately but perhaps not in species that habitually flock.

The Wilson Bulletin. XXXV, No. 2. June, 1923.

Random Notes on the Feeding Habits of Some Kentucky Birds. By B. J. Blincoe.—Red-bellied Woodpecker, Purple Finch, Cedar Waxwing, Catbird, Tufted Titmouse and Carolina Chickadee.

Summer Birds of Cape Cod Compared with those of Missouri. By Gordon Alexander.—With an annotated list of 54 species for Cape Cod, Mass.

Notes on the Bird Life of Allegheny County, Pennsylvania. By Thos. D. Burleigh.—An annotated list, to be continued.

A New Dove from Florida. By H. H. Bailey.—*Zenaidura macroura peninsulari* [sic!], Miami Beach, Fla. (p. 100).

The Oölogist XL, No. 6. June, 1923.

Ornithologia Americana.—An account of the sale of the library of Dr. Wm. C. Braislin.

The Pink-footed Goose in its Breeding Quarters. By W. M. Cosgrove.

Bird Notes from Ward County, N. Dak. By A. S. Peters.

The Oölogist. XL, No. 7 July, 1923.

Spheniscus demersus. By K. T. Redick.

Cassinia. No. XXIV. 1920–1921.

Memorial Sketch of Stewardson Brown, late President of the Delaware Valley Ornithological Club. By Witmer Stone.

Summer Birds of Adams and Franklin Counties, Pa. By J. Fletcher Street.

Migration Reports for 1920–1921, Bibliography and Proceedings of the D. V. O. C.

The Cardinal. No. 2. July, 1923.

Some Observations on the Topography and Structure of the Sewickley Valley [Penna.]; Bird Notes and Spring Migration at Clinton Pond, all apparently by Bayard H. Christy.

The Ibis. (11 Series) V, No. 3. July, 1923.

On the Birds of South-East Yunnan, S. W. China. Part II. By J. D. La Touche.

On the Greater Length of the Day in High Latitudes as a Reason for Spring Migration. By T. M. Savage English.—A suggestion that the Swallow wintering in South Africa continues to go north to Great Britain because the 18–24 hours of daylight—as compared to 12 hours in Africa, make it possible to feed larger broods.

Report of Committee on the B. O. U. List.

On the Specific Name of the Common Guillemot. By F. C. R. Jourdain.—Should be *Uria aalge* (Pont.).

The Birds of Sind. By C. B. Ticehurst. (Continued.)

Report on Birds collected during the Voyage of the Quest. By Geo. H. Wilkins.—The ornithological report of the Shackleton-Rowett Expedition to the Southern Atlantic which is divided into six sections; Plymouth to

South Georgia; South Georgia; Antarctic; Tristan da Cunha, Nightingale and Inaccessible Islands; Gough Island; Homeward Voyage.

Notes on Some Land Birds of the Tristan da Cunha group. By P. R. Lowe.—*Rowettia* (p. 512) is proposed as a new genus for the Gough Island Bunting, *Nesospiza goughensis*, *Nesospiza acunhae questi* (p. 520) and *N. wilkinsi* (p. 521) both from Nightingale Island are also described. There is much interesting discussion of the relationship, pterylography, etc., of these curious isolated birds and a review of the genus *Phrygilus* in which, *P. gayi patagonicus* (p. 515) Tierra del Fuego and *P. g. koslowskii* (p. 515) Chuput, Patagonia are described as new.

Remarks on Prof. Lönnberg's Article on Palaearctic Goshawks. By E. Hartert.

Bulletin of the British Ornithologists' Club. No. CCLXXVIII, April 30, 1923.

Lord Rothschild discusses sporadic and racial hybrids, the latter in his opinion becoming fixed local races.

New forms are described as follows: By Nils Gyldenstolpe, *Poliospiza burtoni somereni* (p. 129), Mt. Elgon, E. Africa; *Trichophorus swainsoni bannermani* (p. 131), Belgian Congo; by E. Hartert, *Prinia gracilis stevensi* (p. 132); Upper Assam and by J. D. LaTouche, *Pratincola torquata yunnanensis* (p. 134), S. E. Yunnan.

Bulletin of the British Ornithologists' Club. No. CCLXXIX, May 28, 1923.

D. Bannerman describes *Camaroptera superciliaris willoughbyi* (p. 138) from the Ivory Coast and *Hirundo rufula kumboensis* (p. 142), N. Nigeria; *Campothera batesi* (p. 143) and *Anomalospiza imberbis tibatiensis* (p. 143); both from Camaroon. G. L. Bates describes a remarkable New Turaco from the Banso Mts., N. Nigeria, for which he proposes a new genus; *Proturacus bannermani* (p. 140).

Col. Meinertzhagen describes three new forms from the Arabian deserts and Dr. Hartert, *Alauda arvensis herberti* (p. 149), Siam, and *Eremomela flaviventris tardinata* (p. 149), Tanganyika. J. D. La Touche names *Eophona migratoria harterti* (p. 150), S. E. Yunnan.

Bulletin of the British Ornithologists' Club. No. CCLXXX. July 20, 1923.

Many new forms are described in this number from E. Africa, Ivory Coast, Arabia, Persia, Nigeria, and Yunnan. Lord Rothschild names the resident Cursor of the Canaries, *Cursorius cursor bannermani* (p. 166); Mr. Kirke Swann has a new hawk *Astur gentilis fujiyamae* (p. 170) from Japan, and most interesting of all Dr. Percy Lowe describes a diminutive flightless Rail from Inaccessible Island in the Antarctic as *Atlantisia rogersi* (p. 175), both genus and species new. The Shackleton-Rowett

Expedition failed to secure specimens of this "Island Hen" but they were subsequently obtained by Rev. H. M. C. Rogers, resident chaplain at Tristan d'Acunha [sic.] and forwarded to the British Museum.

The index, contents, etc., of Vol. xliii complete this number.

British Birds. XVII, No. 1. June 1, 1923.

Additions and corrections to the 'Practical Handbook of British Birds.'

The Malahide, Co. Dublin, Tern Colony. By G. R. Humphreys.

On Some Sixteenth Century Bird Drawings. By N. F. Ticehurst.

Manx Ornithological Notes for 1921 and 1922. By P. G. Ralfe.

British Birds. XVII, No. 2. July 2, 1923.

Birds at Dungeness, September, 1922. By H. G. Alexander.

Some British Birds of the Fourteenth Century. By N. F. Ticehurst.

The Introduction of the Ring-necked Pheasant to Great Britain. By H. S. Gladstone.

British Birds. XVII, No. 3. August 1, 1923.

Seventeenth Century Names for some British Birds. By H. S. Gladstone.

Recent Changes in the Birds of Scilly. By H. M. Wallis.

Avicultural Magazine. (IV Series) I, Nos. 5, 6 and 7. May, June and July, 1923.

Whydahs. By W. Shore Baily (May) and Weavers by the same (June) are interesting accounts of birds most familiar as cage birds. They are illustrated by plates from drawings and photographs.

Game-birds and Pigeons of the Gambia. By Dr. E. Hopkinson, is a continued paper.

The Romance of a Tropical Forest. By J. B. Housden (June).—In southwestern Texas(!). The Baltimore Oriole and Red-headed Woodpecker were obviously misidentifications and what the "Long-billed Butcherbird" may have been we are in doubt. Why our English visitors who intend to write up their experiences do not secure some standard work on American birds with which to identify the species we cannot understand.

The Emu. XXIII, Pt. 1. July, 1923.

Tree Creepers of the Genus Climacteris. By A. J. Campbell.

The Wing Markings of the Black-backed Magpie (*Gymnorhina tibicen*). By H. L. White.

The White Goshawk (*Astur novae-hollandiae*). By H. L. White.

Comparative Osteology of the Australian Mud-builders (*Corcorax*, *Struthidea* and *Grallina*). By R. W. Shufeldt.

Birds of the Wairarapa Plains. By R. H. D. Stidolph.

Synopsis of Species of Thornbills. By A. G. Campbell, Jr.—*Acanthiza* and *Geobasileus*.

The Coastal Habitat of the Striped Honey-eater (*Plectorhyncha lanceolata*). By J. F. H. Gagerley.

Some Notes on Young Penguins (*Eudyptes*). By R. S. Sutherland.

Life of the Birds of the Murrumbidgee Irrigation Areas. By K. McKeown.

Birds of a Melaleuca Patch. By N. Chaffer and H. Wolstenholme.

Remarks on Storm Petrels. By Gregory M. Mathews.

Palaearctic Ornithologists and Australian Birds. By G. M. Mathews.—Criticism of Meinertzhagen on Orioles.

Notes on the Harinonius Shrike-Thrush (*Colluricincla harmonica*). By D. F. F. Thomson.

Notes on the Proper Protection of the Mutton Bird Rookery at Cape Woolamai. By F. Lewis.

Notes on Birds seen on a Recent Trip up the Diamentina River. By G. Aiston.

A Bell-Miner Colony. By H. Wolstenholme and J. Sutton.

The South Australian Ornithologist. VII, No. 3. July, 1923.

Mainly devoted to meetings of the society and local items with notes on certain Petrels. By A. M. Morgan.

Revue Francaise d'Ornithologie. Vol. 15, No. 170. June 7, 1923. [In French.]

Note on the Wild Guinea of Moroco. By L. Lavauden and J. de Chavigny—*Numida sabyi* Hart.—Account of the bird, its eggs, etc.

Revue Francaise d'Ornithologie. Vol. 15, No. 171. July 7, 1923.

The Ostriches of the French Soudan. By Major Wilbert.

Study of a Collection of Mexican Brids. By J. Berlioz.—Obtained by M. Genin in the Orizaba region.

L'Oiseau. IV, Nos. 4, 5, 6 and 7. April to July, 1923. [In French.]

Contains the articles on Icteridae, Plocerdae and Sturoridae which appear in 'The Avicultural Magazine' and several descriptions of aviaries and collections of live birds.

Le Gerfaut. Ann. 13, Fasc. 1, and 2. 1923. [In French.]

Circaetus gallicus and its Allies. By Ch. Dupond (fasc. 1).

Gallinula chloropus chloropus. By L. Coopman (fasc. 2).

Also many local notes for Belgium.

Ardea. XII, No. 1. July, 1923. [In Dutch.]

Ornithological Observations in Holland. By E. D. Van Oort.

Results of Bird Banding by the Royal Museum at Leyden. By E. D. Van Oort.

Voyage and Adventures of François Legaut and *Legautia gigantea* Schleg. By A. E. H. Swaen.

The Plumages of *Uria troille*. By Jan Verwey.

Observations on the Lightship "Schouwenbank." By G. Traanberg.

Proceedings of Meetings, etc.

Yearbook of the Netherlands Ornithological Club. No. 13, Afl. 2. 1923. [In Dutch.]

Local Notes, Proceedings, etc.

Tori. III, No. 15. July, 1923. [In Japanese.]

On a Rare Pheasant, *Reinhardius ocellatus*. By M. Hachisuka.

Some Additions to the Avifauna of Formosa. By S. Uchida.

On the Migration of Some Waders near Wakayagi. By S. Kumagai.

Spring Birds at Chikuzen, Kinsiu. By N. Kuroda.

History of Birds, II. By K. Wada.

Journal für Ornithologie. Jahr. 71, Heft 2–3. April–July, 1923. [In German.]

The Song of Birds and the Periodical Sexual Secretion. By H. Böker.

The Birds of the Sinai Peninsula. By O. Le Roi. (Continued.)

Buteo vulpinus intermedeus in Sweden. By O. Graf Zedlitz.

On the Velvet and Silky Structure of Bird Feathers. By B. Rensch.

The Wings of Archaeopteryx. By O. Heinroth.

Account of the Ornithology of Northeastern France. By L. Schuster. (Continued.)

New Birds from South China. By E. Stresemann.—Twelve races described.

New Birds from Szetschwan. By E. Stresemann.—Five races.

On Some Woodpeckers from Adamana. By H. Grote.—*Dendropicos lafresnayi adamauae* (p. 368) and *Campothera punctuligera riggenbachi* (p. 369).

Ornithologische Monatsberichte. Jahr. 31, No. 4. July–August, 1923. [In German.]

An Important Bird Collection of the 18th Century.—By E. Hartert.

Two Hitherto Undescribed Birds from Central Africa. By O. Neumann.—*Lophoceros melanoleucus stegmanni* (p. 75) and *Smithornis sharpei eurylaemus* (p. 76).

On the West African Races of *Mesopicos goertae*. By H. Grote.—*M. g. oreites* (p. 78) described as new.

Ornithologische Monatsberichte. 31, No. 5. September–October, 1923.

On the Speech of Parrots and their Mental Capacity. By F. von Lucanus.

The History of Some Canary-bird Breeds. By E. Stresemann.

On the Voices of Asio otus and Strix aluco. By F. Tischler.

Dryoscopus gambensis erwini (p. 109) is described from west of Tanganjika by M. Sassi and *Lybius vieilloti tessmanni* (p. 110) from East Cameroon by H. Grote.

Ornithologische Beobachter. XX, Heft. 8, 9 and 10–11. May, June, July–August, 1923. [In German.]

Observations in the Bosphorus Region. By A. Malhey Dupraz is continued through these numbers, and there are many local notes, etc.

Ornithological Articles in Other Journals.

Norton, Arthur H. Notes on Birds of the Knox Co. Region [Maine]. (Maine Naturalist, III, No. 1.)

Macnamara, Charles. Bird Voices of the Northern Woods. (Natural History, XXIII, No. 3.)—At Arnprior, Ontario.

Anthony, H. E. In the Footsteps of Balboa. (Ibid., No. 4.)—On the Isthmus of Darien.

Baxter, E. V. and Rintoul, L. J. Report on Scottish Ornithology for 1922. (Scottish Naturalist, May–June, 1923.)—Concluded in July–August number.

Smith, J. N. Douglas. Glandular Secretion in the Golden Plover.

Stone, Witmer. The Academy's Department of Birds. (Ann. Reports of the Academy of Natural Sciences of Philadelphia for 1922.)

Adams, William C. Good Shooting for All. (American Forestry, August, 1923.)—Federal Public Shooting Grounds.

Nelson, E. W. Community Protection of Migratory Wild Fowl in Florida. (Ibid., September, 1923.)

Avery, Carlos. In Behalf of Our Waterfowl. (Ibid.)—Beautiful photographic illustrations to these three articles.

Peters, James Lee. A New Quail from Lower California. (Proc. N. E. Zool. Club, VIII, May 16, 1923.)—*Lophortyx californica achrustera* (p. 79), La Paz.

CORRESPONDENCE.

Genus Neopisobia.

Editor of 'The Auk:'

In the last number of 'The Auk,' p. 524, under the heading *Neopisobia*, the A. O. U. Committee on Nomenclature says that this genus "is a strict synonym of *Pisobia*." If you look up the original reference, as

there given, you will find that I founded the new genus on the bird, which up till and after that time was known as *Totanus damacensis* Horsf., viz., *Tringa subminuta* Midd., this is proved by the measurements given.

The bird on which the genus was founded is figured and described in the same part of my work as *Pisobia damacensis*.

I would be much obliged if the Committee would look into this matter again with the above facts duly considered.

Yours Sincerely,

GREGORY M. MATHEWS.

NOTES AND NEWS.

As a fellow editor we sympathize fully with the editor of 'Bird-Lore' in the appeal for commendation as well as criticism, which he has presented in a recent editorial. "Issue after issue," he says, "the Editor through his own pen or that of his contributors, addresses an unseen, and, as a rule, unresponsive audience. An apparent or actual error is promptly called to his attention but he can assume that he has won the approval of his readers only by their failure to criticize," and then in lieu of commendation from his readers, he proceeds to tell us himself, what a thoroughly good magazine 'Bird-Lore' is, and all that he says we would enthusiastically endorse.

'Bird-Lore' this year reaches its 25th mile-stone and all the volumes stand facing us on our library shelves. In the first is pasted a letter dated October 29, 1898 in which the would-be editor writes us regarding "a proposed magazine to be primarily the organ of the Audubon Societies." He says: "Our bookshelves are strewn with the wrecks of popular bird journals and before launching my craft I want both to make careful soundings and to man a good crew. If after a fair trial I find the thing will not go I shall not ask for aid to keep alive a moribund magazine, but shall withdraw from the field. And by the way how does 'Birds Afield' strike you for a title or do you prefer 'Bird-Lore'?"

From the start there was no question about "the thing going" and each year we have marveled at the sea-worthiness of the craft, to continue his simile, and the skill of the man at the wheel, though we realize now that we have not given voice to our thoughts as we should have done, to cheer on the lone mariner. This we now do with all our heart and having done the proper thing by our worthy contemporary, we would call *our* readers' attention to 'The Auk,' which this year completes its fortieth volume, and in setting forth its claims to attention we feel that we are encroaching in no way upon the glories of 'Bird-Lore' since the two journals occupy quite different fields and are not comparable even though they be incomparable.

The Secretary of the A. O. U., upon visiting the editorial office recently, exclaimed, "Why there is 'The Auk' all in one row! I never saw that before!" And there it is, the 40 volumes occupying just six feet of space (exclusive of the Nuttall Bulletin and the two index volumes which make 9 inches more).

Forty-six inches, comprising 26 volumes (12,600 pages), to the credit of the late Dr. J. A. Allen, and twenty-six inches, 12 volumes (7,363 pages), to that of the present editor. From these figures it can readily be seen that 'The Auk' has been enjoying a steady and healthy growth of late, culminating with the current volume, which contains 700 pages and forms, we believe, the largest volume of an ornithological journal ever published.

It includes 210 contributions from 132 individuals, 53 being leading articles and 157 general notes and editorial items, and in addition there are reviews of 66 books and papers, 82 ornithological journals and notices of 130 papers published in other journals. The range of subject has been great. There are papers dealing with the life histories of various species and the nesting habits of others; discussions of migration and geographic distribution; annotated lists of the birds of various states and countries; philosophical discussions of such problems as the development of song, and of mating habits and influence of environment; methods of field observation and of bird banding with the results of the latter; papers on food habits, osteology, feather structure and coloration; on nomenclature, classification, and descriptions of new species; notes on bibliography; biographies of noted ornithologists and historical contributions.

While a majority of the papers naturally deal with the birds of North America, in which alone the greatest number of our members are interested, yet the field is by no means limited to these and bird life in almost all parts of the world is touched upon, while the quarterly reviews gives one an up to date summary of the ornithological literature of the world.

It is not to be expected that 'The Auk' will continue to measure up to the dimensions of Volume XL since several articles published in it were paid for by their authors with the request that they should not interfere with the publication of any papers regularly scheduled for this year. Furthermore, a volume of 500 pages is found to be as much as it is possible for an editor to handle efficiently who is compelled to do the work in spare moments from a busy life devoted to other interests.

Let us hope that the A. O. U. may be able to secure the entire time of some future editor when our journal may attain a scope and perfection that cannot be realized today.

It may be that our estimate of our present volume will be questioned since, as we well know, 'The Ibis' has exceeded our pagination, but, it must be remembered that the latter journal carries an average of about 100 words less per page than does 'The Auk.' Writing in 1884, the late Dr. Coues stated that objection had been made to the name of our journal because it aped 'The Ibis.' He dismissed the charge on the grounds that

'Auk' was a great improvement on 'Ibis' because it was one syllable and three letters whereas 'Ibis' was two syllables and four letters, but in all other respects he was glad to have 'The Auk' ape or imitate 'The Ibis' and mentioned various qualities of the latter which he hoped 'The Auk' might eventually attain. We cannot help thinking that many of these hopes have been realized although some of 'The Ibis's' good qualities, such as a wealth of colored plates, we have yet to acquire. At the same time we are somewhat elated to find that sacred bird actually following in the waddling foot-steps of 'The Auk' in the matter of a quarterly review of literature!

And so, after forty years, we heartily endorse the first half of Dr. Coues' wish of 1884, and modestly hope that we have fulfilled the second!

"May its ['The Ibis'] shadow, already 'sacred,' be cast while the pyramids stand: and may 'The Auk' in due time be also known of men as an antient and honourable foule."—W. S.

JOHN HENRY GURNEY, an Honorary Fellow of the Union since 1921, died at his home, Keswick Hall, near Norwich, England, Nov. 15, 1922. He was the son of John Henry Gurney, Sr., and was born at Easton Hall, near Norwich, July 31, 1848. Both father and son had similar tastes, were deeply interested in ornithology, and at the first meeting of the Union were elected to membership, J. H. Gurney, Sr., as an Honorary Member, and his son as a Corresponding Member. Neither, however, remained very long in the Honorary list; the father died in 1890, seven years after election, and the son a year after he had been made an Honorary Fellow. John Henry Gurney, Jr., received his education at Harrow and devoted most of his time and energies to local activities in Norfolk. He took an active interest in the Norwich Museum and added to the magnificent collection of raptorial birds presented by his father to that institution and of which collection he published a catalogue in 1894.

While his interests and attention were chiefly centered on his home county he found time occasionally for travel and in 1870 spent five months in Algeria. His first book published in 1876, entitled 'The Rambles of a Naturalist in Egypt and other Countries,' included notes on Algeria and Russia, and in 1901 he brought out a catalogue of the birds of the French Riviera, a locality which he frequently visited. His publications as shown by a list issued in 1918 numbered more than 130 titles most of which naturally related to the birds of Norfolk.

Gurney's interests lay largely in historical channels and two of his historical books are of special importance. One, 'The Gannet—a Bird with a History,' 1913, was devoted to a species in which he had been interested ever since 1879 when he first visited Bass Rock, and the other was entitled 'Early Annals of Ornithology,' 1921, in which was assembled a rich collection of facts regarding the progress of ornithology from the 4th to the 18th centuries inclusive.

Gurney was highly esteemed by those who knew him as an agreeable and entertaining companion, a courteous and reliable correspondent, and a generous and public spirited citizen. Seldom has there been such continuity in interest in birds on the part of father and son, and seldom has anyone, devoting himself, as did John Henry Gurney, Jr., primarily to the local avifauna, made contributions of more permanent value to the literature of ornithology.—T. S. P.

William Henry Hudson, a Corresponding Fellow of the Union since 1895, died in London, Aug. 18, 1922. He was born of English parents in Argentina, about forty miles south of Buenos Aires, on St. Dominic's Day, Aug. 4, 1842,[1] and had just passed his 80th birthday at the time of his death. His early years were spent on his father's estancia and during this period he gained many of the experiences which in later years formed the basis of his books. At the age of sixteen he suffered from an illness from which he never fully recovered and which compelled him to lead an outdoor life. About 1874 he went to England and took up his residence in London which thenceforth became his home.

His published works include some 57 titles and his popularity as a writer during his later life gives no indication of the constant struggle with poverty and discouragement that marked the first ten or fifteen years of his career as an author. Shortly before his death he asserted that publishers threw money at him with both hands and he gave up his Civil List Pension of £150 which had been awarded him in 1901. His first contribution that appeared in print was an article in 'Cassell's Family Magazine' for March, 1875, under the title 'Wanted, a Lullaby' which contained a poem of 40 lines and was signed "Maud Merryweather."

To ornithologists Hudson is best known from the 'Argentine Ornithology, a Descriptive Catalogue of the Birds of the Argentine Republic,' in two volumes, 1888–89, to which he contributed the life histories and Dr. P. L. Sclater the technical matter; the later edition of the same work without the technical matter, entitled 'Birds of La Plata,' 1920, by Hudson alone; and by his 'Naturalist in La Plata,' 1892. Accounts of his early home appeared in 'The Purple Land that England Lost,' 1885; 'Idle Days in Patagonia,' 1893; 'El Ombu,' 1902, and 'Far Away and Long Ago,' 1918. Among his sketches of English birds and impressions of English rural life should be mentioned 'Birds in a Village,' 1893; 'British Birds,' 1895; 'Birds in London,' 1898; 'Nature in Downland,' 1900; 'Birds and Man,' 1901; 'Hampshire Days,' 1903; 'The Land's End,' 1908; 'Afoot in Eng-

[1] For some reason the exact place and date of his birth long remained a mystery. In 'Far Away and Long Ago—a History of My Early Life,' p. 4, he himself says that he was born at "Los Veinte-cinco Ombues," or the Estancia of the 25 Ombu Trees, and on p. 317 that he was born on St. Dominic's Day. Several erroneous dates have been assigned as the time of his birth and even G. F. Wilson in a 'Bibliography of the Writings of W. H. Hudson,' p. 9, 1922, gives the year of his birth as 1841.

land,' 1909; 'A Shepherd's Life,' 1910; 'Adventures Among Birds,' 1913; 'Birds in Town and Village,' 1919; 'The Book of a Naturalist,' 1919, and a 'Traveller in Little Things,' 1921.

Mr. Hudson took an active interest in the Royal Society for the Protection of Birds, served as a member of its council, prepared several of its leaflets, and made the Society the residuary legatee under his will.

While not a technical ornithologist he took high rank as a nature writer and occupied a prominent place in the field of literature. He was "a master of the finest type of English prose," his style was a model of clarity and beauty and, according to a writer in the 'London Morning Post,' "he was never guilty of a sloppy thought or a slovenly sentence." Unfortunately he left directions that all his manuscripts, notebooks and letters not marked for publication should be destroyed.—T. S. P.

John Lewis James Bonhote, a Corresponding Fellow of the Union since 1911, died at Bournemouth, England, Oct. 10, 1922. He was born in London in 1875, the only son of the late Col. John Bonhote, and was educated at Elstree, Harrow and Trinity College, Cambridge. He early developed an interest in zoology and especially in aviculture. In 1897, he received an appointment as Private Secretary to the Governor of the Bahamas and during his residence there and on a later visit in 1901–02, he made observations on the avifauna of the islands which formed the basis of two papers in 'The Auk' for 1901 and 1903 and several in 'The Ibis' and the 'Avicultural Magazine.' He also saw service in Egypt in the zoological gardens at Giza from 1913 to 1919 where, as opportunity offered, he collected in the Delta and did much to aid in reestablishing the Egret colonies.

Bonhote was an active worker in the various ornithological organizations of which he was a member. He joined the British Ornithologists' Union and the Avicultural Society in 1894, and was elected a member of the Council of the latter Society in 1895, Secretary in 1899, and subsequently became Treasurer. In the B. O. U. he became a member of the Committee of the Union in 1903 and served as Secretary from 1907 to 1913. In the British Ornithologists' Club he served as Secretary of the Migration Committee from 1904 to 1910 and as Secretary and Treasurer of the Club from 1920 until his death. He was also one of the joint secretaries of the Fourth International Ornithological Congress, a Fellow of the Linnean and Zoological Societies, and for many years served on the council of the Royal Society for the Protection of Birds.

He was particularly interested in aviculture and migration and his papers dealt largely with birds in captivity, color changes and heredity. He published important observations on hybridizing ducks and on the eclipse plumages of waterfowl. One of his best known works is his 'Birds of Britain,' 1907, with 100 illustrations in color. He was full of energy, a hard worker, a good speaker, an original thinker and a good organizer.

According to Dr. C. B. Ticehurst "he was a great acquisition on any committee, and the success of the Fourth Ornithological Congress, in 1905, was largely due to his organizing capacity as joint Secretary, and he was one of the best Secretaries the [British Ornithologists'] Union ever had." —T. S. P.

EDUARD BACHOFEN VON ECHT was born on March 12, 1830, at Haus Gais near Oelde, Westphalia, Germany. He was a schoolmate and friend of the well known ornithologist, Bernard Altum, afterwards Professor at Eberswalde, and from his early boyhood developed a strong taste for natural history. After completing his college studies he moved to Nussdorf near Vienna, Austria, and went into the brewing business. In the early 70's he joined the Ornithologischer Verein at Vienna, became its President in 1882, and took active interest in all its affairs up to its dissolution. He was one of the organizers of the first International Ornithological Congress held at Vienna in April, 1884.

A liberal patron of Sciences and Arts, he made valuable gifts to various public institutions at Vienna, and it may be especially mentioned that he purchased and presented the fine Oological collection of the late Hermann Furnes to the Natural History Museum of Vienna. He died at Nussdorf on May 22, 1922, at the ripe age of ninety-two years.—C. E. HELLMAYR.

ENOS ABIJAH MILLS, elected an Associate of the Union in 1916, died at his home on Long's Peak, Colo., Sept. 21, 1922. He was born near Kansas City, Mo., April 22, 1870, and was self-educated. At the age of 16 he took up his residence in a cabin at the foot of Long's Peak and made this his home for many years. He explored the Rocky Mountain region on foot, especially in Colorado, acted as a guide on Long's Peak, and was said to have ascended the mountain more than 250 times.

He has written a number of books and articles on wild life and conservation, including 'The Story of Estes Park,' 1905; 'Wild Life in the Rockies,' 1909; 'The Spell of the Rockies,' 1911; 'Rocky Mountain Wonderland,' 1915; 'Your National Parks,' 1917; 'The Adventures of a Nature Guide,' 1919; and others, several of which contain references to the characteristic birds of the region. Mills was always interested in conservation of wild life and scenery and in the development of National Parks. His activity, locally, in this latter field gained for him the title of "Father of the Rocky Mountain National Park." While not an ornithologist in the strict sense of the term, he was a keen observer and was familiar with the more conspicuous species of the Rocky Mountain region. Through his publications and lectures and his work as a nature guide, and especially through his ability to interest young people, he was able to reach a large audience and did much to popularize the study of birds and other living things in the field.—T. S. P.

THOMAS LEO MCCONNELL, an Associate of the American Ornithologists' Union since 1915, died in Pittsburgh, Pa., October 13, 1922. He was born

in Kittanning, Pa., December 10, 1882 and, several years later, moved to McKeesport, Pa., residing there until 1919, at which time he moved to Emsworth, Pa., where he resided at the time of his death. He attended the University of Pennsylvania and, after graduating in 1906, entered the United States Engineering Service. In 1921 he became associated with the West Penn Power Company of Pittsburgh, and held a responsible position with the engineering department of that organization.

He was a charter member of the Audubon Society of Western Pennsylvania, a keen observer, an accurate reporter, and full of his love of the birds and their ways. His notebook, kept as religiously as he kept his Sunday morning devotion, was an accurate account of the birds as they came and departed, season after season, for fully fifteen years, and his many contributions to various publications, materially helped to influence public opinion in favor of bird study and bird protection.

Besides his widow, Mrs. Cecelia McConnell, he leaves a daughter and four sons.—T. Walter Weiseman.

James Stirton Wallace, an Associate of the Union since 1907, died at Smith's Falls, Ontario, July 24, 1922, as the result of an accident. He was spending his vacation at his summer home at Ridean Lake and had evidently climbed a poplar tree to cut off some dead limbs, when he slipped or took hold of a dead branch and fell to the ground. When found by two neighbors he was lying under the tree unconscious. Examination showed that he had sustained a fracture of the fifth vertebra and he was removed to the hospital at Smith's Falls where he died three days later.

Mr. Wallace was born in Southampton, Bruce Co., Ontario, in 1868, and while still a boy went to Toronto where he attended the city schools. He began his business career with the firm of Taylor, Scott & Co., dealers in brooms and brushes, and subsequently entered the service of the St. Croix Soap Manufacturing Co., where he remained thirty years and at the time of his death occupied the position of sales manager. While he did not publish much he was a keen observer and left many notes on Canadian birds. He was a sportsman and was also greatly interested in horticulture. "Wallace's garden," as his special plot at the Lambton Club was called, was the admiration of visitors. He was fond of flowers, trees, birds and the outdoor world generally, was a delightful companion in the field, and what he knew he knew well. He was unmarried and is survived by two brothers and three sisters.—T. S. P.

T. Gilbert Pearson, President of the National Association of Audubon Societies and President of the International Committee for Protection of Birds, who represented the Union at the International Congress for the Protection of Nature at Paris, May 31 to June 3, returned from Europe on July 23 after a successful trip to France, England, Switzerland, Hungary and Italy. At the International Congress he secured the adoption of two resolutions, one calling on all nations that had not already done so to protect

small birds, and the other to restrict the sale of feathers and prohibit the export and importation of bird plumage.

In Hungary he had conferences with leading scientific men in Budapest and received assurances that a bird protective organization would be formed in a short time and that representatives would be appointed on the International Committee. In Italy he secured the cooperation of the University of Bologna, the National Zoological Society, the Society for the Protection of Animals at Rome and the National Conservation Society and arranged for the appointment of representatives on the Committee. During his visit in England, the English section of the ommittee held two meetings and is now well organized to take up the comprehensive program of work which it has outlined. With the active interest aroused in several countries on the Continent as well as in England the outlook for international bird protection is now brighter than ever.

The Williams Galapagos Expedition, in charge of William Beebe and including in its personnel John Tee Van and ten others, returned May 16 from a voyage to the Galapagos Islands on the steam yacht "Noma." The expedition was absent ten weeks and brought back a rich collection of zoological material including 27 live birds, 160 bird skins and many nests, eggs, photographs, drawings and notes. Landings were made on Albemarle, Chatham, Duncan, Indefatigable, James and Tower Islands. A preliminary résumé of the trip by Beebe, illustrated with photographs by Tee Van, appeared in the May number of the N. Y. 'Zoological Society Bulletin' and a full account is promised in a volume to be published this autumn by G. P. Putnam's Sons.

Eastern Bird Banding Association. On April 24, 1923, a meeting was held at the American Museum in New York, of persons interested in bird banding, fostered by the Linnaean Society of New York. Besides the hundred or more persons from New York and vicinity, there were present, as guests, Mr. Frederick C. Lincoln of the U. S. Biological Survey, Mr. S. Prentiss Baldwin, President of the Inland Bird Banding Association, and four representatives of the New England Bird Banding Association, Dr. C. W. Townsend, President; Mr. Laurence B. Fletcher, Secretary; Mr. A. C. Bent and Mr. Chas. L. Whittle.

Mr. Lincoln and Mr. Baldwin gave talks on bird banding illustrated by lantern slides. At the close of the meeting a Committee was appointed to represent those present, and to ascertain the sentiment of bird banders of the vicinity of New York, in organizing a Bird Banding Association.

As this Committee did not wish to assume authority beyond the locality of New York, Mr. Baldwin and Mr. Lincoln were invited to assist in obtaining the cooperation of persons interested from other states. As it was obviously impossible to assemble a meeting at one time and place, from so wide an area, this has been done by correspondence.

The Association to be called the Eastern Bird Banding Association will include New York, Pennsylvania, New Jersey, Delaware, Maryland and Virginia, and may include a part of Canada and West Virginia, and other states to the South, if desired.

Officers: President, Dr. Arthur A. Allen, of Cornell University; Vice-President, Frank L. Burns, Berwyn, Pa.; Secretary, Mrs. J. E. B. Webster, New York; Treasurer, Maunsell S. Crosby, Rhinecliff, N. Y. Members of Council: Beecher S. Bowdish, Rudyerd Boulton, H. H. Cleaves, John A. Gillespie, R. E. Horsey, R. H. Howland, R. J. Middleton, John T. Nichols, Dr. Lewis Rumford, Dr. Witmer Stone.

JUST as we go to press we are in receipt of an attractive volume on 'Birds of the New York City Region,' by Ludlow Griscom, forming No. 9 of the Handbook Series of the American Museum of Natural History. The book will be reviewed in the January 'Auk.'

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ERRATA.

Page 131, line 30, for "mislabeled," read unlabeled.
" 132, " 39, " "lands," " sands.
" 132, " 8, " "season," " on.
" 163, " 25, " "Koo," " Koo.
" 544, " 30, " "*Saxicola*," " *Oenanthe*.
" 576, " 9, " "Leonard Steineger" read Leonhard Stejneger.

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Saunders, Aretas A., 48 Longview Ave., Fairfield, Conn....(1907)1920
Seton, Ernest Thompson, Greenwich, Conn.....(1883)1901
*Sherman, Miss Althea R., National via McGregor, Iowa..(1907)1912
*Shiras, Hon. George, 3d, Stoneleigh Court, Washington, D. C.....(1907)1915
Stephens, Frank, Nat. Hist. Museum, San Diego, Calif.....(1883)1901
Stephens, Prof. T. C., Morningside College, Sioux City, Iowa.(1909)1920
Storer, Tracy Irwin, Mus. Vert. Zool., Berkeley, Calif.....(1916)1922
Strong, Dr. Reuben M., 706 S. Lincoln St., Chicago, Ill.....(1889)1903
*Swales, B. H., U. S. Nat. Mus., Washington, D. C.....(1902)1909
Swenk, Myron W., 1410 N. 37th St., Lincoln, Neb.....(1904)1920
Thayer, John Eliot, Lancaster, Mass.....(1898)1905
Townsend, Dr. Charles H., Aquarium, Battery Park, New York, N. Y.....(1883)1901
Townsend, Dr. C. W., 98 Pinckney St., Boston, Mass.....(1901)1905
Trotter, Dr. Spencer, Swarthmore College, Swarthmore, Pa..(1888)1901
Tyler, Dr. Winsor M., 522 Mass. Ave., Lexington, Mass....(1912)1917
Warren, E. R., 1511 Wood Ave., Colorado Springs, Colo.....(1902)1910
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WILLETT, GEORGE, Craig, Alaska.....(1912)1914
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WOLCOTT, Dr. ROBERT H., State University, Lincoln, Neb....(1901)1903
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WOOD, NORMAN A., Museum Univ. of Mich., Ann Arbor, Mich. (1904)1912
WRIGHT, Dr. ALBERT H., Upland Road, Ithaca, N. Y.....(1906)1919
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ABBOTT, WALDO L., Hotel Somerset, Boston, Mass.....1921
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ADAMS, BENJAMIN, Wethersfield, Conn.....1911
ADAMS, Dr. CHARLES E., 29 W. Broadway, Bangor, Me.....1922
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ATHERTON, EDWARD H., 22 Aldworth St., Boston, 30, Mass.....1917
ATWELL, GEORGE, C., Strafford, N. H.....1920
AVERILL, CHARLES KETCHUM, 159 Hazelwood Ave., Bridgeport, Conn. 1919
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BABCOCK, Dean, Long's Peak, Colo.....1911
BACON, BRASHER C., Madisonville, Ky.....1922
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BADGER, LESTER R., 2401 Lake Place, Minneapolis, Minn.....1920
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BAGG, JOHN LEONARD, 89 Lexington Ave., Holyoke, Mass.....1918
BAILEY, ALFRED M., Colorado Mus. Nat. Hist., Denver, Colo.....1918
BAILEY, Prof. GUY A., Geneseo, N. Y.....1910
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BAIRD, ROBERT LOGAN, 279 Oak St., Oberlin, Ohio.....1921
BAKER, JACK D., Willets, Mendocino Co., Calif.....1920
BAKER, FRANK L., 42 Rosemont St., Dorchester, Mass.....1922
BALES, Dr. BLENN R., 149 W. Main St., Circleville, Ohio.....1907
BALL, Mrs. BENNETT F., Oakville, Conn.....1905
BALL, EDWARD M., East Falls Church, Va.....1918
BALL, Dr. JOS. P., 5001 Frankford Ave., Philadelphia, Pa.....1911
BANCROFT, GRIFFING, 2525 First St., San Diego, Calif.....1921
BARBER, Prof. BERTRAM A., 264 West St. North, Hillsdale, Mich...1920
BARBER, FURNALD K., La Fox, Kane Co., Ill.....1920
BARBOUR, Rev. ROBERT, Box 224, Montclair, N. J.....1902
BARCLAY, WILLIAM, Barre, Vermont.....1921
BARKER, Miss HELEN, 421 E. Adams St., Sandusky, O.....1918
BARLOW, HENRY HOYT, 1707 Kilbourne St., N. W., Washington, D. C.....1921

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BARNES, Hon. R. MAGOON, Lacon, Ill.....1889
BARRETT, CHAS. H. M., 1339 Valley Place S. E., Washington, D. C...1912
BARRETT, HAROLD LAWRENCE, 172 Huntington Ave., Boston, Mass..1909
BARROWS, IRA, 15 Maiden Lane, New York, N. Y.....1920
BARRY, Miss Anna K., 5 Bowdoin Ave., Dorchester, 21, Mass.....1907
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BARTRAM, EDWIN B., Bushkill, Pike Co., Pa.....1913
BASCOM, H. P., Stockton, Barbados, B. W. I.....1922
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BATCHELOR, Mrs. E. C., Narberth, Pa.....1922
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BATES, Rev. J. M., Red Cloud, Neb.....1918
BATTEN, GEORGE, 15 University Place, Princeton, N. J.....1914
BATTERSBY, HERMAN WM., Oak Lake, Manitoba.....1922
BAYNES, ERNEST HAROLD, Meriden, N. H.....1918
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BEAUPRE, EDWIN, Princess St., Kingston, Ont.....1922
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BELL, Dr. W. B., Biological Survey, Washington, D. C.....1912
BENJAMIN, Mrs. ALFRED, 350 Summer Ave., Newark, N. J.....1920
BENKENSTEIN, Hon. L. J., U. S. Commissioner, Beaumont, Tex.....1921
BENNETT, Rev. GEORGE, Iowa City, Iowa.....1913
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BERLIN, Mrs. CORA D., 423 Fourth St., Marietta, Ohio.....1920
BERMAN, DANIEL, 70 Morningside Drive, New York, N. Y.....1919
BERRY, ORVILLE P., 735 College St., Bedford City, Va.....1922
BICKNELL, Mrs. F. T., 319 S. Normandie Ave., Los Angeles, Calif...1913
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BIGELOW, Mrs. A. P., Ogden, Utah.....1919
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BILL, DEAN E. GORDON, 32 Occom Ridge, Hanover, N. H.....1922
BISCHOFF, FRANK L., Rock Port, Mo.....1921
BISHOP, Mrs. BESSIE F., Lyonsdale, Lewis Co., N. Y.....1922
BISHOP, SHERMAN C., N. Y. State Museum, Albany, N. Y.....1919
BIXBY, HENRY D., Huntington, L. I., N. Y.....1922
BLACKWELDER, ELIOT, Stanford University, Calif.....1895
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BLAKE, BENJAMIN S., Auburndale 66, Mass.....1920
BLAKE, Dr. IRVING H., 38 North Main St., Orono, Me.....1922

BLINCOE, BENEDICT J., Rt. 13, Dayton, Ohio.....1921
BLOOMFIELD, Mrs. C. C., 729 West Main St., Jackson, Mich.....1901
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BOEHNER, REGINALD STEPHEN, Syracuse Univ., Syracuse, N. Y.....1919
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BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo...1909
BOND, HARRY L., Lakefield, Minn.....1908
BONFILS, FREDERICK G., The Denver Post, Denver, Colo.....1918
BONNETT, D. B., Bay Head, N. J.....1920
BOSSON, CAMPBELL, 19 Brewster St., Cambridge, Mass.....1906
BOULTON, W. RUDYERD, JR., 983 Bedford Ave., Brooklyn, N. Y.....1915
BOURNE, THOMAS L., 262 Long Ave., Hamburg, N. Y.....1913
BOWDEN, Miss ENID, 305 Waverly St., Ottawa, Ont.....1921
BOWDEN, Mrs. MARIE L., 305 Waverly St., Ottawa, Ont.....1921
BOWDISH, B. S., Demarest, N. J.....1891
BOWDISH, Mrs. B. S., Demarest, N. J.....1902
BOWDITCH, Dr. HAROLD, 44 Harvard Ave., Brookline, Mass.....1900
BOWEN, MAURICE S., Box 327, Middleboro, Mass.....1921
BOYD, DONALD H., Box 466, Hobart, Ind.....1920
BOYD, Mrs. HARRIETT T., 17 Marsh St., Dedham, Mass.....1917
BOYLE, ASHBY D., 380 E. St., Salt Lake City, Utah.....1921
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BRADBURY, W. C., Room 505–6, Railroad Bldg., Denver, Colo.....1915
BRADLEE, THOMAS STEVENSEN, South Sudbury, Mass.....1902
BRADSHAW, FRED, Dept. of Agriculture, Regina, Sask.....1921
BRAINERD, Dr. JOHN BLISS, 419 Boyleston St., Boston, Mass.....1921
BRALLIAR, FLOYD, Madison, Tenn.....1921
*BRANDRETH, COURTNEY, Ossining, N. Y.....1905
*BRANDRETH, FRANKLIN, Ossining, N. Y.....1889
BRANDT, HERBERT W., 2025 East 88th St., Cleveland, Ohio.....1915
BRANNON, PETER A., Box 358, Montgomery, Ala.....1919
BREDER, CHAS. M., JR., Aquarium, Battery Park, New York, N. Y. 1919
BREWSTER, Mrs. WILLIAM, The Charlesworth, 535 Beacon St., Boston, Mass.....1912
BRICKENSTEIN, Miss MARY R., 1603 19th St., Washington, D. C.....1920
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....1910
*BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....1902
BRIGHT, STANLEY, Eighth and Elm Sts., Reading, Pa.....1921
BRIMLEY, H. H., State Museum, Raleigh, N. C.....1904
BRISTOL, Miss F. L., 169 Columbia Heights, Brooklyn, N. Y.....1921
BROCKWAY, ARTHUR W., Hadlyme, Conn.....1912

BRONSON, BARNARD S., 175 Jay St., Albany, N. Y.....1920
BROOKING, A. M., Inland, Neb.....1920
BROOKS, Rev. EARLE AMOS, 70 Clark St., Everett, Mass.....1892
BROOKS, GORHAM, 60 State St., Boston, Mass.....1919
BROUNSTEIN, MORRIS, 303 Columbus Ave., Boston, Mass.....1922
BROWN, MISS ANNIE H., 31 Maple St., Stoneham, Mass.....1909
BROWN, Miss BERTHA L., 53 Court St., Bangor, Me.....1918
BROWN, Mrs. CHAS. E., Babcock St., Brookline, Mass.....1922
BROWN, C. EMERSON, Zool. Gardens, W. Philadelphia, Pa.....1921
BROWN, EDMUND P., 48 Union St., Belfast, Me.....1920
BROWN, EDWARD J., Box 99, Eustis, Fla.....1891
BROWN, G. FRANKLIN, "Stonebridge," Needham, Mass.....1917
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.....1912
BROWN, SAMUEL E., 10 Oakland St., Lexington, Mass.....1920
BROWN, WM. JAMES, 250 Oliver Ave., Westmount, Quebec.....1908
BROWNING, WM. HALL, 16 Cooper Square, New York, N. Y.....1911
BRUEN, FRANK, 29 High St., Bristol, Conn.....1908
BRULEY, ROGER S., 64 Center St., Danvers, Mass.....1922
BRUMBAUGH, CHALMERS S., 2606 Elsinor Ave., Baltimore, Md.....1916
*BRUUN, CHAS. J., 314 Reliance Bldg., Kansas City, Mo.....1919
BUCHANAN, CHAS. J., 320 N. Illinois St., Indianapolis, Ind.....1922
BUGBEE, E. H., Williamstown, N. J.....1921
BULL, CHARLES L., Oradell, N. J.....1920
BULLOCK, D. S., Bureau of Agrl. Economics, U. S. Dept. of Agri., Washington, D. C.....1920
BUNKER, CHARLES D., Kansas University Museum, Lawrence, Kan..1916
BURBANK, Mrs. DELANCEY G., 17 Cherry St., N. Adams, Mass.....1920
BURBANK, Mrs. GEORGE E., Sandwich, Mass.....1922
BURGESS, HENRY C., M. D., Brigham Hall, Canandaigua, N. Y.....1920
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....1898
BURGESS, THORNTON WALDO, 61 Washington R'd., Springfield, Mass..1919
BURLEIGH, THOS. D., Univ. of Ga., Athens, Ga.....1913
BURNETT, WILLIAM L., Agric. College, Fort Collins, Colo 1895
BURNHAM, JOHN, 218 Timken Bldg., San Diego, Calif.....1920
BURNHAM, STEWART HENRY, College of Agriculture, Cornell Univ., Ithaca, N. Y.....1919
BURTCH, VERDI, Branchport, N. Y.....1903
BUSHBY, FRED. W., 17 Washington St., Peabody, Mass.....1922
BUTCHER, HOWARD, JR., Stanfair and Wistar R'ds, Ardmore, Pa.....1921
BUTLER, EDWARD, Bains, La.....1920
BUTLER, Miss VIRGINIA, Stockbridge, Mass.....1919
BUTTERWORTH, FRANK SEILER, JR., 616 Yale Station, New Haven, Conn.....1918
BUTTS, HARRY W., Dryden, N. Y.....1920
BUZZELL, Mrs. JAMES C., 11 Hudson St., Bangor, Me.....1918

Byrd, Mrs. Hiram, Oxford, Fla.....1918
Caduc, Eugene E., 539 Massachusetts Ave., Boston, Mass.....1910
Cahn, Alvin R., 1117 W. Nevada St., Urbana, Ill.....1917
Caldwell, Guy C., 63 Oxford St., Cambridge, Mass.....1920
Caldwell, Lee, 442 Webster St., Traverse City, Mich.....1921
Calhoun, Miss Emma May, 216 E. Front St., Monroe, Mich.....1921
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Camburn, Mrs. Osman M., 6 Oak Knoll, Arlington 74, Mass.....1920
Campini, Chas. A., 154 E. 33rd St., New York, N. Y.....1919
Cannon, Gabriel, Spartanburg, S. C.....1920
Cant, Howard F., 35 Lansdowne Road N., Galt, Ont.....1921
Carlisle, George L., Jr., 550 Park Ave., New York, N. Y.....1920
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Carpenter, George I., 129 Dean St., Brooklyn, N. Y.....1907
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Carter, John D., Lansdowne, Pa.....1907
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Chase, Sidney, Nantucket, Mass.....1904
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COVELL, Dr. HENRY H., 1600 East Ave., Rochester, N. Y.....1918
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CRANE, Miss CLARA L., Dalton, Mass.....1904
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CRIDDLE, NORMAN, Treesbank, Man.....1918
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CROWELL, ANTHONY E., East Harwich, Mass.....1922
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DARLEY, Mrs. WM. M., Box 245, Monte Vista, Colo.....1922
DAVENPORT, Mrs. ELIZABETH B., Brattleboro, Vt.....1898
DAVIDSON, Dr. A. M., 856 Palmerston Ave., Winnipeg, Man.....1922
DAVIDSON, Mrs. FRANCES S., 1917 Emerson Ave., S., Minneapolis, Minn.....1921
DAVIES, Miss DOROTHY E., Blackinton, Mass.....1920
DAVIS, Miss Bertha E., 22 Cypress Place, Brookline, 46, Mass.....1920
DAVIS, Mrs. DANIEL R., Coram, N. Y.....1922
DAVIS, HENRY W., 10 S. Baton Rouge Ave., Ventnor, Atlantic City, N. J.....1922

DAVIS, JOHN M., 737 M. St., Eureka, Calif.....1920
DAVIS, R. N., Everhart Museum, Scranton, Pa.....1920
DAVIS, RICHARD J., 23 Wellington St., Arlington, Mass.....1922
DAY, CHESTER SESSIONS, 16 Browne St., Brookline 47, Mass.....1897
DAY, CLAUDE B., 210 Highfield St., Moncton, N. B.....1922
DEAN, F. ROY, 3465 S. Spring Ave., St. Louis, Mo.....1919
DEAN, R. H., 720 Quintard Ave., Anniston, Ala.....1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....1899
DEARBORN, SAMUEL S., 411 Marlborough St., Boston, Mass.....1919
DELOACH, R. J. H., 10145 Longwood Drive, Chicago, Ill.....1910
DELURY, Dr. RALPH E., Dominion Observatory, Ottawa, Canada..1920
DE MILLE, JOHN B., 559 W. 183rd. St., New York, N. Y.....1922
DEVANY, J. L., Annapolis Royal, Nova Scotia.....1921
DENNIS, Dr. LABAN, 71 Ridge Ave., Orange, N. J.....1921
DENSMORE, Miss MABEL, 910 4th St., Red Wing, Minn.....1910
DERBY, Dr. RICHARD, Oyster Bay, L. I., N. Y.....1898
DERY, Dr. D. A., 112 Rue St. Joseph, Quebec, Canada.....1921
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....1900
DEWIS, Dr. JOHN W., 69 Newbury St., Boston 17, Mass.....1920
DEXTER, Prof. JOHN SMITH, 70 Loomis St., Naperville, Ill.....1919
DEXTER, LEWIS, 11 Allen St., Newburyport, Mass.....1915
DICE, LEE RAYMOND, Univ. Mus., Ann Arbor, Mich.....1918
DICKENS, Miss ELIZABETH, Block Island, R. I.....1921
DICKEY, ADAM H., Forest Ave., Cohasset, Mass.....1922
DILLE, FREDERICK M., Niobrara Reservation, Valentine, Neb.....1892
DINGLE, EDWARD VON S., Summerton, S. C.....1920
DINGS, G. MCCLELLAND, 2161 Railway Exch. Bldg., St. Louis, Mo...1919
DIONNE, C. E., Laval University, Quebec, Canada.....1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....1891
DIXON, JOSEPH S., Univ. of Calif., Berkeley, Calif.....1917
DONAHUE, RALPH J., 228 N. Emerson Ave., Bonner Springs, Kan...1919
DOOLITTLE, E. A., Box 44, Painesville, Ohio.....1921
DOOLITTLE, Miss MAUDE, 23 Naples Road, Brookline, Mass.....1922
DRAPER, Miss SARAH L., Saxton's River, Vermont.....1921
DRAPER, WALLACE S., Wayland, Mass.....1920
DREIER, THEODORE, 35 Remsen St., Brooklyn, N. Y.....1919
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.....1904
DUANE, ARTHUR, 128 E. 34th St., New York, N. Y.....1920
DUBOIS, ALEXANDER D., 327 S. Glenwood Ave., Springfield, Ill.....1918
DUER, HARRY ELDON, 519 Schofield Bldg., Cleveland, Ohio.....1921
DULL, Mrs. A. P. L., P. O. Box 188, Harrisburg, Pa.....1900
DUNBAR, Miss LULA, Rt. 1, Elkhorn, Wis.....1918
DUNN, Mrs. H. A., Rt. 3, Box 63, Athol, Mass.....1920
DURFEE, OWEN, 7272 Madison St., Fall River, Mass.....1887
DUSTIN, Miss FLORENCE S., 30 Arlington St., Cambridge, Mass.....1922

DUVAL, WM. M., Bonaventure Id., County Gaspé, Quebec.....1922
DYE, HAROLD G., Rt. 2, Ontario, N. Y.....1921
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....1902
EADIE, GUY L., Berwyn, Pa.....1920
EARL, THOMAS M., 258 Lexington Ave., Columbus, Ohio.....1921
EARLE, OSBOURNE, 17 Bates St., Cambridge, Mass.....1919
EASTMAN, Col. FRANCIS B., P. O. Box 334, Baltimore, Md.....1909
EASTMAN, Miss SARAH C., 51 Chapel St., Portland, Me.....1920
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....1909
EATON, SCOTT HARRISON, Box 653, Lawrenceville, Ill.....1912
EATON, WARREN FRANCIS, 17 Weld Hall, Cambridge, Mass.....1921
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....1886
EDSON, WM. L. G., 54 Fairview Ave., Rochester, N. Y.....1916
EDWARDS, J. HOWARD, 1664 Beacon St., Brookline, Mass.....1922
EHINGER, Dr. CLYDE E., 728 Franklin St., Keokuk, Iowa.....1904
EIFRIG, Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....1901
EIGENBROD, ALBERT E., 2736 Iberville St., New Orleans, La.....1922
EIMBECK, Dr. AUGUST F., New Haven, Mo.....1906
EKBLAW, WALTER ELMER, 711 W. Nevada St., Urbana, Ill.....1911
ELIOT, WILLARD AYRES, 1011 Thurman St., Portland, Ore.....1918
ELLIOT, Miss SARAH J., Union Hospital, Terre Haute, Ind.....1920
ELLIOTT, Mrs. JANE SHIELDS, 2900 Q. St., N. W., Washington, D. C..1921
EMERSON, W. OTTO, Hayward, Calif.....1916
EMILIO, S. GILBERT, 156 Hobart St., Danvers, Mass.....1922
EMLEN, ARTHUR COPE, "Awbury," Germantown, Philadelphia, Pa...1921
ENGLISH, Mrs. T. F., 3631 Campbell St., Kansas City, Mo.....1919
ENO, HENRY LANE, Princeton, N. J.....1918
ERICHSEN, W. J., 2311 Barnard St., Savannah, Ga.....1919
ESLUCK, Miss AUGUSTINE W., 58 Highland Ave., Greenfield, Mass...1920
ESTERLY, Dr. CALVIN O., Occidental College, Los Angeles, Calif.....1921
EVANS, Dr. EVAN M., 550 Park Ave., New York, N. Y.....1916
EVANS, FRANK C., Crawfordsville, Ind.....1919
EVANS, WILLIAM B., Moorestown, N. J.....1897
EVANS, WILLIAM V., 410 East Geyser St., Livingston, Mont.....1921
EYER, GEO. A., Short Hills, N. J.....1918
FAGAN, CHAS. L., Rt. 2, Box 58, Rahway, N. J.....1922
FAIRMAN, Miss MARIAN, 4744 Kenwood Ave., Chicago, Ill.....1920
FALGER, Mrs. WM., 224 Magnolia Ave., Modesto, Calif.....1918
FARLEY, FRANK L., Camrose, Alberta.....1920
FARLEY, JACK, 46 S. Broadway, White Plains, N. Y.....1922
FAXON, ALLAN HART, 7 Edwards St., Southbridge, Mass.....1916
FAY, S. PRESCOTT, 2 Otis Place, Boston, Mass.....1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....1898
FELL, Miss EMMA TREGO, Holicong, Bucks Co., Pa.....1903
FELT, GEO. R., 71 Main St., Peabody, Mass.....1922

FERGUSON, ALFRED L., Greenwich, Conn.....1920
FERGUSON, HARRY L., 11 Thomas St., New York, N. Y.....1920
FERRES, Mrs. WALTER D., 78 Sunset Ave., Ridgewood, N. J.....1921
FIELD, DR. GEORGE W., Sharon, Mass.....1910
FIELD, WM. L. W., Milton Acad., Milton, Mass.....1920
FISHER, Miss ELIZABETH WILSON, Ambler P. O., Pa.....1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York, N. Y...1908
FITCH, CONOVER, 50 Dunster Road, Chestnut Hill, Mass.....1922
FITZPATRICK, WM. J., c/o Brown, Durrell Co., 104 Kingston St., Boston, Mass.....1920
FLEISHER, EDWARD, 1068 Park Place, Brooklyn, N. Y.....1916
FLETCHER, L. B., 54 Cotswold Rd., Brookline, Mass.....1921
FLETCHER, LYLE, Norton, Kan.....1919
FLETCHER, Mrs. MARY E., Proctorville, Vt.....1898
FLOYD, CHAS. BENTON, 382 Walcott St., Auburndale, Mass.....1916
FLOYD, J. L., 508 New Harter Bank Bldg., Canton, Ohio.....1921
FOLSOM, Miss IDA M., Normal School, Presque Isle, Me.....1920
FOOT, Dr. NATHAN CHANDLER, 140 Interwood Ave., Clifton, Cincinnati, Ohio.....1916
FORAN, PHILIP FULFORD, 147 Wilbrod St., Ottawa, Ontario, Can....1921
FORBES, RALPH E., 328 Adams St., Milton, Mass.....1917
FORD, EDWARD R., Periodical Publishing Co., Grand Rapids, Mich...1920
FORD, Miss LOUISE PETIGRU, "The Heights," Aiken, S. C.....1919
FORTNER, Prof. HARRY C., 89 N. Prospect St., Burlington, Vt.....1920
*FOSTER, FRANCIS A., Edgartown, Mass.....1918
FOSTER, FRANK B., P.O. Box 87, Haverford, Pa.....1916
FOSTER, Dr. G. S., 967 Elm St., Manchester, N. H.....1921
FOTHERGILL, Miss E. R., 208 S. Whitney St., Hartford, Conn.....1920
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Calif.....1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....1898
FRASER, DONALD, Johnstown, N. Y.....1902
FREAS, ELLA M., 845 W. State St., Trenton, N. J.....1921
FREEMAN, Dr. C. D., Box 113, Medina, Ohio.....1920
FREEMAN, Miss HARRIET E., 258 Mt. Vernon St., West Newton, Mass. 1903
FREEMAN, THOS. E., 128 Pleasant St., Arlington, Mass.....1922
FRENCH, Mrs. A. J., R. F. D. 1, Carlton, Oregon.....1921
FRENCH, CHARLES H., 950 Washington St., Canton, Mass.....1904
FRENCH, Mrs. CHAS. H., 950 Washington St., Canton, Mass.....1908
FRENCH, DANIEL C., Hotel Seymour, New York, N. Y.....1922
FRENCH, Mrs. MENA V., Box 171, Wayland, Mass.....1922
FRIEDMAN, RALPH, 32 Garden Place, Brooklyn, N. Y.....1921
FRIEDMANN, HERBERT, McGraw Hall, Cornell Univ., Ithaca, N. Y...1921
FROST, ALLEN, c/o Trussell Mfg. Co., Poughkeepsie, N. Y.....1919
FRY, HENRY J., 88, 27th St., Elmhurst, L. I., N. Y.....1916
*FUGUET, HOWARD, 560 Bullitt Bldg., Philadelphia, Pa.....1919

FULLER, Mrs. ANNIE L., Hancock, N. H. 1922
FULLER, ARTHUR B., 2717 Euclid Ave., Cleveland, Ohio 1922
FULLER, HENRY C., 1348 Euclid St., Washington, D. C. 1916
FULLER, Mrs. T. OTIS, 1037 Great Plain Ave., Needham, Mass. 1909
FULTON, HARRY L., 5631 S. Troy St., Chicago, Ill 1922
FUNKE, HERBERT F. L., 116 Broad St., New York, N. Y. 1921
GAGE, ARTHUR, Camp Douglas, Rt. 2, Box 36, Wisconsin 1920
GALVIN, E. R., 5056 DuPont Bldg., Wilmington, Del. 1921
GANIER, ALBERT F., 2507 Ashwood Ave., Nashville, Tenn. 1917
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio 1903
GARDNER, ASTON COLEBROOK, "Little Tangley," Ember Lane, Esher, Surrey, England 1919
GARDNER, Mrs. E. P., 140 Gibson St., Canandaigua, N. Y. 1920
GARDNER, JAMES H., 121 East 6th St., Tulsa, Okla. 1919
GARDNER, Mrs. W. H., Bucksport, Me. 1920
GARST, Dr. JULIUS, 29 Oread St., Worcester, Mass. 1916
GAUDETTE, Miss MARIE E., Park Museum, Providence, R. I. 1921
GERTH, WALTER G., Box 38, Park Ridge, Ill. 1918
GIANINI, CHAS. A., Poland, N. Y. 1911
GIBSON, LANGDON, 2 Mt. Vernon Sq., Boston, Mass. 1887
GIFFORD, Dr. HAROLD, 420 S. 36th St., Omaha, Nebr. 1922
GIFFORD, PAUL C., 73 Whittier Ave., Olneyville, R. I. 1921
GIGNOUX, CLAUDE, 73 Tunnel Road, Berkeley, Calif. 1921
GILBERT, Mrs. F. M., Walpole, N. H. 1919
GILCHRIST, Mrs. D. A., 1519 W. Washington St., Phoenix, Ariz. 1920
GILES, ROSCOE I., 82 Newton St., Marlborough, Mass. 1921
GILLIAM, ROBERT A., City Hall, Dallas, Texas 1920
GILLIN, JAMES R., Ambler, Pa. 1921
GILLIS, FRANK, Anoka, Minn. 1922
GILMAN, M. FRENCH, Banning, Calif. 1907
GLADDING, Mrs. JOHN R., Thomspon, Conn. 1912
GLASSFORD, S. ROBERT, 63 Highland Ave., Ridgewood, N. J. 1921
GLEASON, Mrs. C. H., 700 Madison Ave., S. E., Grand Rapids, Mich. 1917
GLOYD, HOWARD K., Wellsville, Kan. 1920
GOELITZ, WALTER A., 170 Nunda Boulevard, Rochester, N. Y. 1916
GOLSAN, LEWIS S., Box 97, Prattville, Ala. 1912
GOODE, Mrs. F. B., Sharon, Mass. 1918
GOODRICH, Miss JULIET T., State Line, Vilas County, Wis. 1904
GORDON, HARRY E., 307 Laburnum Cres., Rochester, N. Y. 1911
GORE, JOHN K., 69 High St., Orange, N. J. 1921
GORMLEY, A. LIGNORI, Box 80, Arnprior, Ont. 1918
GORST, CHARLES C., 28 Beauford R'd, Boston, 30, Mass. 1916
GOSS, JESSE B., 19 High St., Boston, Mass. 1922
GOULD, JOSEPH E., 320 Springfield Ave., Campostella Heights, Norfolk, Va. 1889

GOWANLOCK, J. NELSON, Dept. Zool. Univ., Chicago, Chicago, Ill...1919
GOWANS, Miss ETHEL, Normal College, Kent, Ohio 1921
GOWDY, EARL R., 60 Washington St., Leominster, Mass.....1920
GRANGE, WALLACE B., Ladysmith, Wis.....1920
GRANGER, WALTER W., Amer. Mus. Nat. Hist., New York, N. Y....1891
GRANT, Mrs. ADELE L., Dept. Botany, Cornell Univ., Ithaca, N. Y..1919
GRANT, E. O., Box 61, Patten, Maine.....1922
GRANT, WM. W., 600 Castle St., Geneva, N. Y.....1910
GRAVES, Miss BESSIE M., Box 80, Bethel, Vt.....1920
GRAVES, Mrs. CHARLES B., 4 Mercer St., New London, Conn.....1905
GRAY, GEORGE M., Box 89, Woods Hole, Mass.....1916
GRAY, GEORGE W., Greenvale, Poughkeepsie, N. Y.....1920
GREEN, HORACE OAKES, 114 North Ave., Wakefield, Mass.....1917
*GREEN, MORRIS MILLER, 39 Wyoming Ave., Ardmore, Pa.....1921
GREENE, EARLE R., 108 Orme Circle, Atlanta, Ga.....1921
GREENLAW, JOS. M., 28 Budleigh St., Beverly, Mass.....1920
GREENOUGH, HENRY VOSE, 39 Worthington Road, Brookline, Mass..1901
GREGORY, Rev. C. E., Box 215, Morganton, N. C.....1922
GREGORY, STEPHEN S., JR., 345 Barry Ave., Chicago, Ill.....1916
GRIFFEE, WILLET E., Corvallis, Ore.....1919
GRIFFIN, BERTRAM S., Box 17, West Newbury, Mass.....1917
GRIM, WILLIAM H., Hamburg, Pa.....1921
GROSVENOR, Miss LULU E., 155 11th St., N. E. Washington, D. C...1920
GRUBB, Miss LILLIE M., Monte Vista, Colo.....1921
GUNTHORP, Prof. HORACE, Univ. of Wash., Seattle, Wash.....1919
HABERYAN, H. D., Box 32, Farmerville, La.....1921
HADELER, E. W., 520 So. State St., Painesville, Lake Co., Ohio.....1920
HADLEY, ALDEN H., Monrovia, Ind.....1906
HADLEY, FRED N., 1305 Roberts Ave., Whiting, Ind.....1921
HAGAR, J. A., Marshfield Hills, Mass.....1914
HAILE, H. PENNINGTON, 28 Edwards St., Springfield, Mass.....1919
HALL, E. RAYMOND, Haskell Institute, Lawrence, Kansas.....1922
HALLINAN, THOMAS, 221 Madison Ave., Paterson, N. J.....1919
HALLINEN, JOSEPH E., Cooperton, Okla.....1919
HAMILTON, Dr. BAKER A., Highland Park, Ill.....1920
HANDLEY, CHAS. O., Box 329, Lexington, Va.....1916
HANDSAKER, RALPH, Colo, Iowa.....1922
HANKINSON, THOS. L., 96 Oakwood Ave., Ypsilanti, Mich.....1897
HANNA, G. DALLAS, California Acad. Sci., San Francisco, Calif.....1919
HANNA, WILSON CREAL, 141 East F. St., Colton, Calif.....1919
HANNUM, WILLIAM E., Primos, Delaware Co., Pa.....1920
HARDING, RICHARD B., 94 Westbourne Terrace, Brookline, Mass....1922
HARDING, Mrs. RICHARD B., 94 Westbourne Terrace, Brookline, Mass. 1922
HARDON, Mrs. HENRY W., Wilton, Conn.....1905
HARING, Mrs. INEZ M., 1774 Delmont Ave., East Cleveland, Ohio..1921

HARKIN, Hon. JAMES B., Commr. Canadian Nat. Parks, Ottawa, Can...1921
HARPER, SAMUEL A., 230 N. Keystone Ave., River Forest, Ill.....1920
HARRINGTON, Mrs. A. B., Lincoln, Mass.....1919
HARRINGTON, Dr. PAUL, 813 Bathurst St., Toronto, Ont.....1922
HARRINGTON, RALPH M., 84 Long Ave., Hamburg, N. Y.....1915
HARRIS, SYDNEY, Vineyard Haven, Mass.....1922
*HARRISON, GEO. L., Jr., 400 Chestnut St., Philadelphia, Pa.....1919
HARRISON, HARRY MORGAN, 319 Penn St., Camden, N. J.....1919
HART, CECIL, Rt. 6, Box 432, Los Angeles, Calif.....1921
HART, Miss HELEN, Williamstown, Mass.....1920
HARTLEY, GEO. INNES, 344 W. 87th St., New York, N. Y.....1919
HARVEY, JOHN L., 3 Moody St., Waltham, Mass.....1916
HASBROUCK, HENRY C., 929 West End Ave., New York, N. Y.....1920
HASKELL, Miss SADIA, 1236 11th St., N. W., Washington, D. C.....1916
HASTINGS, WALTER E., Box 1, South Lyon, Mich.....1921
HATHAWAY, ALTON HASTINGS, 25 Oakland St., Lexington, Mass.....1921
HATHAWAY, Mrs. E. L. Spring St., Rt. 1, W. Bridgewater, Mass.....1920
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....1897
HAVEMEYER, H. O., Mahwah, N. J.....1893
HAVEMEYER, H. O., Jr., Mahwah, N. J.....1919
HAVEN, HERBERT, M. W., 500 Forest Ave., Portland, Me.....1920
HAWES, Dr. EDWARD E., Hyannis, Mass.....1920
HAWK, JOHN L., 5843 Plymouth Ave., St. Louis, Mo.....1920
HAWLEY, Mrs. ELIZABETH A., 74 Edward Ave., Pittsfield, Mass.....1922
HEALEY, ALDEN P., 21 Spring St., Pittsfield, Mass.....1919
HEALY, Dr. DANIEL J., 154 Bell Court East, Lexington, Ky.....1921
HEATH, Miss CHARLOTTE M., Box 76, Easton, Mass.....1920
HEDGES, CHAS. F., 1505 Pearl St., Miles City, Mont.....1919
*HELME, ARTHUR H., Miller Place, N. Y.....1888
HEMENWAY, AUGUSTUS, Tavern Club, Bolyston Pl., Boston, Mass...1920
HEMPEL, Miss KATHLEEN, Elkader, Iowa.....1919
HEMPHILL, ASHTON ERASTUS, Holyoke, Mass.....1919
HENDERSON, HARLIN C., Carpenteria, Santa Barbara Co., Calif.....1920
HENDERSON, JUNIUS, 627 Pine St., Boulder, Colo.....1903
HENDERSON, WALTER C., 4727 13th St., N. W., Washington, D. C...1917
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....1885
HERMAN, THEODORE L., 273 Neal Dow Ave., New Brighton, N. Y...1916
HERMAN, Dr. WILLIAM C., 19 West 7th St., Cincinnati, Ohio.....1921
*HERRICK, HAROLD, 123 William St., New York, N. Y.....1905
HERRICK, NEWBOLD L., 60 Wall St., New York, N. Y.....1913
HERRICK, N. LAWRENCE, Cedarhurst, N. Y.....1917
HERRICK, Mrs. W. H., Topsfield, Mass.....1922
HESTER, Mrs. FRANCIS O., 6111 Greenwood Ave., Chicago, Ill.....1922
HIGBEE, HARRY G., Moose Hill Bird Sanctuary, Sharon, Mass.....1922

HILDRETH, Miss ELLEN, 6 Linnaean St., Cambridge, Mass.....1922
HILL, JAMES HAYNES, 108 State St., New London, Conn.....1897
HILL, Mrs. THOMAS R., Box 491, Chautauqua, N. Y.....1903
HIMMEL, WALTER J., Dept. of Botany, Iowa City, Iowa.....1920
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.....1912
HINE, ASHLEY, 8131 Euclid Ave., Chicago, Ill.....1922
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....1899
HISCOX, EVERETT H., Jewett City, Conn.....1922
HITCHCOCK, FRANK H., 120 Broadway, New York, N. Y.....1921
HIX, GEORGE E., 337 72nd St., Brooklyn, N. Y.....1904
HOLLAND, HAROLD MAY, Galesburg, Ill.....1910
HOLLAND, R. P., 2273 Woolworth Bldg., New York, N. Y.....1920
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....1899
HOLLISTER, G. B., 4 E. 5th St., Corning, N. Y.....1919
HOLLISTER, WARREN D., Delavan, Wisc.....1901
HOLMAN, JOHN P., 9 East 40th St., New York, N. Y.....1922
HOLMAN, RALPH H., Wellesley Hills, Mass.....1907
HOLT, ERNEST G., 312 Bell Bldg., Montgomery, Ala.....1911
HONYWILL, ALBERT W., JR., 211 Ridgefield St., Hartford, Conn.....1907
HOPKINS, George I., 841 Beech St., Manchester, N. H.....1922
HORNING, Dr. J. E., Luscar, Alberta, Can.....1922
HORSEY, RICHARD E., Highland P'k,. Reservoir Ave., Rochester, N.Y. 1919
HORSFALL, ROBERT BRUCE, R. F. D. 6, Box 80, Portland, Ore.....1905
HOTCHKISS, NEIL, R't. 2, Marcellus, N. Y.....1919
HOUGHTON, CLARENCE, 533 Washington Ave., Albany, N. Y.....1920
HOWE, CLIFTON D., Univ. of Toronto, Toronto, Ontario.....1921
HOWE, Mrs. E. L., Princeton, N. J.....1921
HOWE, INEZ ADDIE, Fairbanks Mus. Nat. Sci., St. Johnsbury, Vt..1921
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....1907
HUBBARD, C. ANDRESEN, Pacific University, Forest Grove, Ore....1916
HUBBARD, Prof. MARIAN E., 15 Appleby Road, Wellesley, Mass.....1916
HUBBARD, RALPH, 1038 University Ave., Boulder, Colo.....1916
HUDSON, Mrs. L. K., Simeon, Cherry Co., Nebr.....1922
HUEY, L. M., 2875 Clay Ave., San Diego, Calif.....1920
HUGHES, GEO. T., Box 153, Plainfield, N. J.....1919
HUGHES, Dr. WILLIAM E., 3945 Chestnut St., Philadelphia, Pa.....1920
HULL, Mrs. BAKER, The Washington Apts., Baltimore, Md.....1921
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.... 1895
HUNT, CHRESWELL JOHN, 5847 W. Superior St., Chicago, Ill.....1919
HUNT, Miss LUCY O., 185 Beacon St., Hartford, Conn.....1919
HUNT, RICHARD, 737 Bryant St., Palo Alto,, Calif..... 1918
HURD, Miss FRANCES A., 43 West Ave., S. Norwalk, Conn.....1919
HUSHER, Mrs. GERTRUDE H., 821 S. Hope St., Los Angeles, Calif... 1918
HYDE, A. SIDNEY, 606 Penn. Ave., Urbana, Ill 1921

HYDE, Mrs. S. E., c/o Mayfield Stage, Boise, Idaho.....1918
HYSLOP, SAMUEL, 42 Bellevue St., Newton, Mass.....1919
IJAMS, H. P., 609 Empire Bldg., Knoxville, Tenn.....1922
INGERSOLL, ALBERT M., 908 F St., San Diego, Calif.....1885
ISHAM, CHAS. B., 909 Valley Rd., Upper Montclair, N. J.....1891
IVOR, HANCE ROY, 260 Crawford St., Toronto, Ont.....1921
JACKSON, Dr. HARTLEY H. T., Biological Survey, Washington, D. C. 1910
JACKSON, JOHN W., Belchertown, Mass.....1920
JACKSON, RALPH W., R. D. 1, Box 70, Cambridge, Md.....1918
JAMES, NORMAN, Catonsville, Md.....1913
JAMES, THOMAS A., Augusta, Me.....1920
JANVRIN, Dr. E. R. P., 515 Park Ave., New York, N. Y.....1919
JAY, WILLIAM, 12 Westview St., Mt. Airy, Philadelphia, Pa.....1921
JENKS, CHAS. W., Bedford, Mass.....1912
JENNEY, Hon. CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....1905
JENNINGS, Dr. GEO. H., Jewett City, Conn.....1918
JENNINGS, PHILIP B., Wayside, Old Bennington, Vt.....1922
JENNINGS, RICHARD D., 129 Harrison St., East Orange, N. J.....1913
JENSEN, J. K., U. S. Indian School, Santa Fe, N. Mex.....1912
JEWETT, STANLEY G., 582 Bidwell St., Portland, Ore.....1906
JOHNSON, Prof. CHAS. E., Dept. Zool., Kan. Univ., Lawrence, Kan..1919
JOHNSON, FRANK E., 16 Amackassin Terrace, Yonkers, N. Y.....1888
JOHNSON, Mrs. GRACE P., Museum Nat. Hist., Springfield, Mass....1908
JOHNSON, REGINALD M., 60 State St., Boston, Mass.....1920
JOHNSON, WARD L., Lawrence School, Hewlett, Long Island, N. Y...1920
JOHNSTON, I. H., 818 Kanawha St., Charleston, W. Va.....1922
JOHNSTONE, WALTER B., Edgewood, Arrow Lake, B. C.....1920
JONES, CAROLINE SEYMOUR, Box 446, Bennington, Vt.....1922
JONES, JESSE L., 198 Dewey St., Edgewood, Pittsburgh, Pa.....1921
JONES, Dr. LOMBARD CARTER, Falmouth, Mass.....1917
JONES, S. PAUL, 204 Frame Ave., Waukesha, Wis.....1920
JONES, WILLIAM F., Norway, Me.....1918
JONES, STERLING P., 690 Bonita Ave., Webster Groves, Mo.....1921
JORDAN, A. H. B., Lowell, Wash.....1888
JOY, ERNEST, Wood Island, Grand Manan, N. B.....1921
JUDD, E. T., Cando, N. Dakota.....1922
JUMP, Mrs. EDWIN R., 97 Oakleigh Road, Newton, Mass.....1910
JUNG, CLARENCE S., 553 Prospect Ave., Milwaukee, Wis.....1921
KAAN, Mrs. MARY M., 162 Aspinwall Ave., Brookline, Mass.....1922
KAEDING, GEO. L., 104 N. Columbus Ave., Glendale, Calif.....1918
KANE, Mrs. SUSAN MARY, Mich. Club Bldg., Seattle, Wash.....1919
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario, Canada. 1899
KEE, HUNTER, Marlinton, W. Va.....1920
KELLOGG, RALPH T., Silver City, N. M.....1913
KELSO, Dr. JOHN E. H., Edgewood, Lower Arrow Lake, B. C.....1915

KENNAN, Ruth R., 311 West Liberty, Medina, Ohio.....1922
KENNEDY, EDWARD H., South Easton, Mass.....1920
KENNEDY, Dr. HARRIS, Readville, 37, Mass.....1916
*KENNEDY, HARRY H., 105 Vine St., Reno, Nev.....1920
KENT, DUANE E., 39 Morse Place, Rutland, Vt.....1913
KENT, EDWARD G., 9 Highland Ave., Madison, N. J.....1919
KENT, EDWIN C., 19 Liberty St., New York, N. Y.....1907
KEPNER, Mrs. C. M., Howardville, Md.....1922
KESSEL, MARCEL H., 695 Auburn Ave., Buffalo, N. Y.....1920
KEYES, Mrs. C. F., 2225 Lake of Isles Blvd., Minneapolis, Minn....1922
*KIDDER, NATHANIEL T., Milton, Mass.....1906
KILGORE, WILLIAM, Jr., Zool. Mus, Univ. Minn., Minneapolis, Minn 1906
KILGUS, J. FRANK, JR., 422 High St., Williamsport, Pa.....1922
KING, F. M., 111 E. Cedar St., Webster Groves, Mo.....1921
KING, LEROY, 27 E. 83rd St., New York. N. Y.....1901
KINGSBURY, FREDERICK S., 97 Oliver St., Boston, Mass.....1916
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....1910
KIRKHAM, WM. B., 100 Mill St., Springfield, Mass.....1922
KIRKPATRICK, HARRY C., 1166 Water St., Meadville, Pa.....1921
KIRKWOOD, FRANK C., R. F. D. 3, Monkton, Md.....1892
*KIRN, ALBERT J. B., R. F. D. 4, Solomon, Kan.....1918
KITTREDGE, JOSEPH, Jr., Forest Service, Washington, D. C. 1910
KLOSEMAN, Miss J. E., Beal Hall, 20 Charlesgate W., Boston, Mass. 1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....1906
KNICKERBOCKER, CHAS. K., 1214 McCormick Bldg., Chicago, Ill....1922
KNOLHOFF, FERDINAND WILLIAM, Amityville, N. Y.....1890
KNOX, Mrs. SADIE B., 75 Pochassic St., Westfield, Mass.....1922
KOBBE, FREDERICK W., 103 E. 86th St., New York, N. Y.....1921
KOPMAN, HENRY H., Dept. Conservation, 207 N. O. Court Bldg., New Orleans, La.....1921
KREHBIEL, LEONARD, Box 193, Bishop, Calif.....1920
KRETZMAN, Dr. P. E., 3705 Texas Ave., St. Louis, Mo.....1913
KUBICHEK, W. F., 926 Church St., Iowa City, Ia.....1919
KUSER, ANTHONY R., Bernardsville, N. J.....1908
KUSER, Mrs. ANTHONY R., Bernardsville, N. J.....1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....1910
KUTCHIN, Dr. VICTOR, Green Lake, Wis.....1922
LABARTHE, JULES, 2727 Russell St., Berkeley, Calif.....1920
LADD, HARRY STEPHEN, 4354 McPherson Ave., St. Louis, Mo.....1919
LADOW, STANLEY V., 65 W. 9th St., New York, N. Y.....1913
LAFRANCHISE, Miss MARY L. Y., 31 Sherbrooke Ave., Hull, Quebec, Canada.....1921
LAING, HAMILTON M., 1277 E. 32nd St., N. Portland, Ore.....1917
LAIRE, Mrs. MARGARET P., 72 Rebecca Ave., Pleasantville, N. Y....1921

LAMB, CHAS. R., 8 Highland St., Cambridge, Mass.....1910
LANCASHIRE, Mrs. JAMES HENRY, 7 East 75th St., New York, N. Y. 1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York, N. Y.....1907
LANGDON, ROY M., 1302 Williams St., Denver, Colo..... 1918
LANGILLE, JAMES H., Kensington, Md..... 1921
LANO, ALBERT, 120 N. Block St., Fayetteville, Ark.....(1889)1919
LARRABEE, Prof. AUSTIN P., 515 S. Dodge St., Iowa City, Iowa.....1918
LASTRETO, C. B., 260 California St., San Francisco, Calif.....1919
LATHAM, ROY, Orient, N. Y.....1916
LAUGHLIN, Miss EMMA E., 127 Walnut St., Barnesville, Ohio.....1920
LAUGHLIN, J. A., 318 E. Gordon St., Marshall, Mo.....1919
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Philadelphia, Pa.....1902
LAWRENCE, A. G., City Health Dept., Winnipeg, Man.....1920
LAWSON, RALPH, 88 Washington Sq. East, Salem, Mass.....1917
LAZEAR, J. M., 922 S. Negley Ave., Pittsburgh, Pa.....1922
LEACH, FRANK A., Diablo, Calif.....1921
LEARNED, Miss AGNES M., Wilkins St., Hudson, Mass.....1920
LEATHERMAN, Mrs. L. L., 2310 Emerson Ave. S., Minneapolis, Minn..1922
LEE, Mrs. L. W., El Cajon, San Diego Co., Calif.....1920
LEEMING, T. L., 94th St. and 8th Ave., Brooklyn, N. Y.....1922
LEFFINGWELL, DANA J., McGraw Hall, Ithaca, N. Y.....1919
LEISTER, CLAUDE W., McGraw Hall, Ithaca, N. Y.....1916
LEONARD, W. J., Shoreham, Vt.....1920
LEOPOLD, NATHAN F., JR., 4754 Greenwood Ave., Chicago, Ill.....1916
LERMOND, N. W., Thomaston, Me.....1921
LEVEY, Mrs. WILLIAM, 58 Davis Ave., Brookline, Mass.....1915
LEVIN, BENJAMIN SZOLD, 2104 Chelsea Terrace, Walbrook, Baltimore, Md.....1922
LEWIS, GEORGE P., 4559 Forrestville Ave., Chicago, Ill.....1920
LEWIS, HARRISON F., Can. Nat. Parks, Ottawa, Canada.....1912
LEWIS, Mrs. HERMAN E., 180 Grove St., Haverhill, Mass.....1912
LEWY, Dr. ALFRED, 6016 Stony Island Ave., Chicago, Ill.....1922
LIBBEY, ROBERT M., 520 N. Y. Ave., N. W., Washington, D. C.....1920
LIEBOLD, ERNEST G., 589 Boston Blv'd E., Detroit, Mich.....1918
LIGHTFOOT, WILLIAM G., 197 Gileson St., Canandaigua, N. Y.....1920
LIGON, J. STOKLEY, Box 131, Albuquerque, New Mexico.....1912
LINGS, GEO. H., Richmond Hill, Cheadle, Cheshire, England.....1913
LINK, HENRY A., P. O. Box 76, Waterloo, Ind.....1920
LINSDALE, JEAN M., 1827 Barker Ave., Lawrence, Kansas.....1922
LITTLE, Mrs. EFFIE G., R. F. D. 1, Lowell, Indiana.....1922
LITTLE, LESLIE T., Social Law Library, Boston, Mass.....1922
LITTLE, LUTHER, 2nd, 1403 Garfield Ave., So. Pasadena, Calif..... 1913
LLOYD, HOYES, 406 Queen St., Ottawa, Canada.....1916
LOBDELL, Prof. R. N., Experiment Sta., A. and M. College, Miss..1922
LOCKE, Dr. EDWIN A., 311 Beacon St., Boston, Mass.....1920

LOCKWOOD, DEAN P., Haverford Pa.....1921
LODGE, FRED S., 423 S. Stone Ave., La Grange, Ill.....1922
LOMAX, Dr. CLAUDE, Holland, Indiana.....1921
LONG, CHAS. IRVING, 130 5th Ave., Roselle, N. J.....1918
LONG, HARRY V., 260 Clarendon St., Boston, Mass.....1920
LORD, FREDERICK P., 39 College St., Hanover, N. Y.....1922
LORD, J. ANDERSON, 13 Ash St., Danvers, Mass.....1919
LORING, J. ALDEN, Owego, N. Y.....1917
LOTHROP, Dr. OLIVER A., Waban, Mass.....1920
LOW, DANIEL STORY, D. W. House, Amherst College, Amherst, Mass..1922
LOW, ETHELBERT I., 38 E. 64th St., New York, N. Y.....1907
LUCE, Mrs. FRANCIS P., Box 216, Vineyard Haven, Mass.....1912
LUCE, MATTHEW, Cohasset, Mass.....1920
LUM, EDWARD H., Chatham, N. J.....1904
LUNN, Miss LULU M., 724 Villa St., Racine, Wisc.....1920
LUNN, Miss MARGARET A., 131 A–B Govt. Hotels, Washington, D.C1919
LYNCH, JOSEPH, 400 Washington St., Perth Amboy, N. J.....1920
LYON, Dr. MARCUS W., Jr., 214 La Porte Ave., South Bend, Ind.....1922
LYON, WILLIAM I., 124 Washington St., Waukegan, Ill.....1921
MACKAYE, JAMES, 160 Elm St., N. Cambridge, Mass.....1921
MACKINTOSH, RICHARD B., 131 High St., Danvers, Mass.....1919
MACLAY, MARK W., Jr., 20 Exchange Place, New York, N. Y.....1905
MACCARTY Mrs. W. C., 820 Third St., S. W., Rochester, Minn.....1922
MACCOY, CLINTON V., 1213 Beacon St., Brookline, Mass.....1920
MACREYNOLDS, GEORGE, 76 E. State St., Doylestown, Pa.....1917
MACWILLIAMS, JAMES D., 96 Blair Hall, Princeton, N. J.....1922
MADDOCK, Miss EMELINE, Monte Vista, Philadelphia, Pa.....1897
MADISON, HAROLD LESTER, 2289 Grand View Ave., Cleveland Heights, Ohio.....1912
MAGEE, M. J., 603 South St., Sault Ste. Marie, Mich.....1919
MAHER, J. E., 323 Pacific Ave., Jersey City, N. J.....1902
MARBLE, RICHARD M., Woodstock, Vt.....1907
MARCOTTE, Rev. LEON, St. Charles Seminary, Sherbrooke, Quebec, Canada.....1921
MARKS, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.....1915
MARES, Mrs. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.....1903
MARSH, R. K., 1660 Holly St., Denver, Colo.....1922
MARSHALL, ALFRED, Daphne, Baldwin Co., Ala.....1916
*MARSHALL, Mrs. ELLA M. O., New Salem, Mass.....1912
MARTIN, FRED J., R't 1, Box 58, Manchester, N. H.....1921
MARTIN, JOHN C., 909 State St., Owosso, Mich.....1921
MASON, C. E., Jr., 25 Exeter St., Boston, Mass.....1921
MATHEWS, F. SCHUYLER, 17 Frost St., Cambridge, Mass.....1917
MATHIESON, OLAF, 285 Saint John's Place, Brooklyn, N. Y.....1922
MAY, FRANKLIN H., 730 Livingston Ave., Syracuse, N. Y.....1920

MAY, Dr. JOHN B., Cohasset, Mass.,.....1922
MAYFIELD, Dr. GEORGE R., Kissam Hall, Nashville, Tenn.....1917
MAYNARD, CHAS. J., 457 Crafts St., W. Newton, Mass.....1921
MAYNARD, Dr. HERBERT E., 178 Commonwealth Ave., Boston, Mass.1921
McCABE, T. T., Barkerville, B. C., Can.....1920
McCALL, W. W., Millbrook Road, Haverford, Pa.....1921
McCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....1900
McCONNELL, T. L., 151 Center Ave., Emsworth, Pittsburgh, Pa.... 1915
McCOOK, PHILIP J., 413 E. 57th St., New York, N. Y.....1895
McCREA, WM. S., 721 Rush St., Chicago, Ill.....1922
McGRAW, HARRY A., 1805 15th Ave., Altoona, Pa.....1917
McGREW, ALBERT D., 5611 Stanton Ave., Pittsburgh, Pa.....1917
McILHENNY, EDWARD AVERY, Avery Island, La.....1894
McINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass..1908
McKEOUGH, Dr. GEO. T., R't. 1, Erie Manor, Blenheim, Ontario,...1921
McLAIN, ROBERT BAIRD, Box 546, Wheeling W. Va..... 1893
McLELLAN, Miss MARY E., 87, 7th Ave., Apt. 3, San Francisco, Calif..1920
McMILLAN, Mrs. GILBERT N., Delafield Ave., Riverdale on Hudson, New York, N. Y.....1902
McMULLEN, T. E., 551 Bailey St., Camden, N. J.....1920
McNEIL, Dr. CHAS. A., 1112 West 4th St., Sedalia, Mo.....1919
McNEIL, GEORGE M., McGraw Hall, Ithaca, N. Y.....1920
McPHAIL, FRANK L., 1315 Hill St., Ann Arbor, Mich.....1920
MEAD, Mrs. E. M., 234 Central Park West, New York, N. Y.....1904
MEAD, LYLE G., 807 N. Pine Ave., Chicago, Ill.....1921
MEADE, GORDON M., 200 Birr St., Rochester, N. Y.....1921
MEANS, CHAS J., c/o Dr. Gregg, Wellesley, Mass 1912
MEANS, ROBERT W., 19 Pearl St., Boston, Mass.....1922
MEDSGER, OLIVER P., 9 Columbia Ave., Arlington, N. J.....1919
MELLEN, ELEANOR, M. D., 291 Lake Ave., Newton Highlands, Mass.1920
MENGEL, G. HENRY, 739 Madison Ave., Reading Pa.....1913
MENNINGER, WM. C., Cornell Medical College, 477 First Ave., New York, N. Y.....1919
MERCUR, J. WATTS, Jr., Wallingford, Pa.....1920
MERRIAM, HENRY F., Orange Heights Ave., W. Orange, N. J.....1905
MERRILL, D. E., Rogers, Ark.....1913
MERRILL, HARRY, 316 State St., Bangor, Maine.....1883
MERRIMAN, R. OWEN, 96 W. 2nd St., Hamilton, Ont.....1920
*MERSHON, W. B., Saginaw, Mich.....1905
METCALF, F. P., Biological Survey, Washington, D. C.....1917
METCALF, Z. P., State College Station, Raleigh, N. C.....1913
MEYER, Major G. RALPH, Camp Eustis, Va.....1913
MEYER, Miss HELOISE, Lenox, Mass.....1913
MIDDLETON, R. J., Jeffersonville, Pa.....1920
MILLER, ANSEL B., Springs, Pa.....1921

MILLER, Miss BERTHA S., Capstone Farm, R. 3, Kingston, N. Y....1915
MILLER, Miss CARRIE ELLA, 36 Cottage St., Lewiston, Me.....1918
MILLER, CECIL A., 76 Flatt Ave., Hamilton, Ontario, Canada.....1926
MILLER, Mrs. ELIZABETH C. T., 1010 Euclid Ave., Cleveland, O.... 1911
MILLER, FREDERIC W., 935 S. Gaylord St., Denver, Colo..... 1922
MILLER, Mrs. H. C., 1110 Main Street, Racine, Wis.....1922
MILLER, Miss JULIA, R't. 3, Hornell, Steuben Co., N. Y.....1921
MILLER, Miss MARY MANN, 5928 Hayes Ave., Los Angeles, Calif....1921
MILLS, Dr. R. WALTER, 6682 Oakland Ave., St. Louis, Mo.....1922
MILLS, WIER R., Pierson, Iowa.....1929
MINER, LEO D., 1836 Vernon St., N. W., Washington, D. C.....1913
MITCHELL, CATHERINE ADAMS, Box 346, Riverside, Ill.....1911
MITCHELL, HORACE HEADLEY, Provincial Mus., Regina, Sask.....1918
MITCHELL, MASON, U. S. Consul, Valetta, Malta.....1922
MITCHELL, Dr. WALTON I., Paonia, Delta Co., Colo.....1893
MOHR, CARL OTTO, Rapidan, Minn.....1922
MONK, H. C., Avoca Apts., Nashville, Tenn.....1921
MOODY, A. J., c/o. Aetna Life Ins. Co., Hartford, Conn.....1918
MOODY, Dr. WM. LADD, Newport, R. I.....1918
MOORE, ARTHUR D., 712 Phoenix St., South Haven, Mich.....1922
MOORE, Mrs. DWIGHT, Cedar Hill, Closter, N. J.....1920
MORCOM, G. FREAN, 2906 Pine Ave., Berkeley, Calif.....1886
MORE, R. L., 205 W. Wilbarger St., Vernon, Texas.....1921
MORGAN, BRENT M., 224 11th St., S. W., Washington, D. C.....1919
MORGAN, Mrs. ELEANOR L., Hotel Sherwood, Baltimore, Md.....1922
MORLEY, ARTHUR, 26 Minerva St., Swampscott, Mass.....1922
MORRIS, Miss LUCY N., 90½ Midland Ave., Montclair, N. J.....1920
MORRISON, ALVA, 2 Garden Terrace, Cambridge, Mass.....1915
MORRON, THADDEUS D., 60 Hazel St., Hartford, Conn.....1920
MORSE, ALBERT P., Peabody Museum, Salem, Mass.....1922
MORSE, FRANCIS E., 23 Bradlee St., Dorchester 24, Mass.....1921
MORSE, FRANK E., 162 Boylston St., Boston, Mass.....1921
MORSE, GEO. F., Jr., Grove Hall, Mass..... 1919
MORSE, GEO. W., 318 East 9th St., Tulsa, Okla.....1922
MORSE, HARRY GILMAN, Huron, Ohio.....1912
MORSE, Miss M. E., 3513 Bloomington Ave., Minneapolis, Minn....1919
MORSS, CHAS. B., 35 Greenleaf St., Bradford, Mass.....1918
MOSELEY, Prof. EDWIN LINCOLN, Bowling Green, Ohio.....1918
MOSES, Mrs. EDMUND QUINCEY, 16 Fairview Ave., Tarrytown, N. Y..1919
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass 1905
MOULTON, CHAS. E., 72 Maple St., Lynn, Mass.....1922
MOULTON, HERBERT F., 36 W. Main St., Ware, Mass.....1920
MOUSLEY, WM. HENRY, Hatley, Quebec, Canada.....1915
MULLEN, JAMES L., 1264 Logan Ave., Salt Lake City, Utah.....1919
MUNRO, J. A., Okanagan Landing, British Columbia.....1913

MUNRO, Mrs. WALTER S., 40 N. Main St., So. Norwalk, Conn.....1920
MURIE, O. J., 219 7th Ave., S., Moorhead, Minn.....1913
MURPHY, EDW. A. C., 94 Prospect St., New Haven, Conn.....1920
MURPHY, Dr. EUGENE EDMUND, 432 Telfair St., Augusta, Ga.....1919
MURPHY, Mrs. GRACE E. B., 87 Front Ave., Bronxville, N. Y.....1919
MURRAY, EDGAR A., 2940 Clinton Ave., Detroit, Mich.....1919
MURRAY, FRANK F., Box 606, Titusville, Pa.....1922
MUSGRAVE, Mrs. MARK E., Box 765, Phoenix, Ariz.....1920
MUSSELMAN, GUY N., 392 E. Main St., New Holland, Pa.....1921
MUSSELMAN, T. E., 124 S. 24th St., Quincy, Ill.....1922
MYERS, Mrs. HARRIET W., 311 N. Ave. 66, Los Angeles, Calif.....1906
MYERS, Miss LUCY F., 64 Market St., Poughkeepsie, N. Y.....1898
MYERS, ORD, 216th St. and 9th Ave., New York, N. Y.....1922
NAUMAN, E. D., Box 606, Sigourney, Iowa.....1918
*NEELY, JAMES C., 135 High St., Brookline, Mass.....1919
NEFF, JOHNSON A., Marionville, Mo.....1919
NEWBERRY, W. F., 233 Broadway, New York, N. Y.....1920
NEWCOMB, C. A., Jr., Rt. 3, Pontiac, Mich.....1920
NICE, Mrs. MARGARET M., Norman, Okla.....1920
NICHOLS, L. NELSON, N. Y. Public Library, New York, N. Y.....1917
NICHOLS, RODMAN A., 27 Broad St., Salem, Mass.....1919
NICHOLSON, NEVIN G., 410 Elm St., Grove City, Pa.....1920
NIEDRACH, R. J., 3128 W. 40th. Ave., Denver, Colo,.....1922
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.....1913
NININGER, Prof. H. H., McPherson College, McPherson, Kan.....1920
NOBLE, ELEANOR G., 66 Sparks St., Cambridge, Mass.....1916
NOBLE, G. KINGSLEY, Am. Mus. Nat. Hist., New York, N. Y.....1913
NOKES, Dr. I. D., 1120 Marsh St., Los Angeles, Calif.....1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....1903
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa.....1916
NORRIS, J. PARKER, JR., 2122 Pine St., Philadelphia, Pa.....1904
NOTT, Miss ETHEL A., 309 S. Pine St., Reedsburg, Wis.....1920
NOWELL, Miss MARY, 12 Linnaean St., Cambridge, Mass.....1922
NUGENT, JAMES R., 772 Broad St., Newark, N. J.....1920
*O'CONOR, JOHN CHRISTOPHER, 24 E. 33rd St., New York, N. Y....1921
OGDEN, DAVID B., 23 Alton Place, Brookline, Mass.....1920
OGDEN Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....1897
OLDYS, HENRY, Silver Spring, Md.....1896
ONDESCO, Miss MARY E., Gardner, Ill.....1920
OSBORN, Prof. HENRY F., Am. Mus. Nat. Hist., New York, N. Y....1919
OSBORN, MARY E., 418 Church St., Evanston, Ill.....1922
OSBORNE, ARTHUR A., 183 Lowell St., Peabody, Mass.....1912
OSLER, H. S., 1, Rosedale Road, Toronto, Ont.....1920
OSWALD, W. A., 301 Wilson Ave., Notre Dame de Grace, Montreal, Canada.....1922

OTTEMILLER, C. FREE, 752 S. George St., York, Pa.....1914
OVER, WILLIAM H., Geol. and Nat. Hist. Survey, Vermillion, S. Dak 1921
OVERTON, Dr. FRANK, Patchogue, N. Y.....1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....1897
PACKARD, WINTHROP, 1442 Washington St., Canton, Mass.....1917
PAINE, AUGUSTUS G., JR., 31 E. 69th St., New York, N. Y.....1886
PAINE, CHARLES JACKSON, 705 Sears Bldg., Boston, Mass.....1917
PAINE, JOHN B., Weston, Mass.....1922
PAINTER, KENYON V., 3240 Fairmount Blv'd., Cleveland, Ohio.....1920
*PALMER, Miss E. D., 1741 S. Harvard Blv'd., Los Angeles, Calif...1918
PALMER, R. H., Instituto Geologico, City of Mexico, D. F., Mexico...1916
PALMER, Dr. SAMUEL C., 712 Ogden Ave., Swarthmore, Pa.....1899
PALMER, Mrs. T. S., 1939 Biltmore St., N. W., Washington, D. C...1918
PANGBURN, CLIFFORD H., 299 Madison Ave., New York, N. Y.....1907
PARKER, ARTHUR JOHN, So. Lincoln, Mass.....1920
*PARKER, EDWARD LUDLOW, Nashawtuc Rd., Concord, Mass.....1916
PARKER, BARTOL, Framingham Centre, Mass.....1922
PARKER, HERBERT, So. Lancaster, Mass.....1920
PATCH, Dr. EDITH M., College Road, Orono, Me.....1921
PATTEN, Dr. STEPHEN K., 141 Milk St., Boston, Mass.....1920
PAUL, LUCIUS H., 436 Carter St., Rochester, N. Y.....1908
PAULSON, MARTIN C., R. F. D. 5, Nevada, Iowa.....1922
PEABODY, Rev. P. B., Blue Rapids, Kan.....1903
PEACOCK, W. C., State and Adams St., Chicago, Ill.....1921
PEASE, Miss FLORENCE M., Box 265, Conway, Mass.....1922
PELLEW, Miss M. J., 1637 Mass. Ave., N. W., Washington, D. C....1919
PEMBER, KARL A., Woodstock, Vt.....1921
PEMBERTON, JOHN ROY, Box 1112, Tulsa, Okla.....1918
*PENROSE, Dr. CHAS. BINGHAM, 1720 Spruce St., Philadelphia, Pa...1919
PEPPER, Dr. WM., 1813 Spruce St., Philadelphia, Pa.....1911
PERCIVAL, Mrs. D. C., 306 Commonwealth Ave., Boston, Mass.....1921
PERINE, KEBLE B., 3 Ware St., Dorchester, Mass.....1917
PERKINS, Dr. ANNE E., State Hospital, Collins, N. Y.....1917
PERKINS, ARTHUR W., 21 High St., Farmington, Me.....1915
PERKINS, EARLE B., 134 Pine St., S. Portland, Me.....1922
PERKINS, EDW. H., Box 52, Waterville, Me.....1920
PERKINS, Dr. GEORGE H., Univ. of Vt., Burlington, Vt.....1912
PERKINS, Mrs. W. L., 1603 Garland St., Flint, Mich.....1922
PERRY, GEO. P., 310 Locust St., Sterling, Ill.....1922
PERRY, Dr. HENRY JOSEPH, 45 Bay State Road, Boston, Mass.....1909
PETER, JULIUS C., Detroit Trust Co., Detroit, Mich.....1921
PETERS, ALBERT S., Donnybrook, N. Dakota.....1908
PETERS, JOS. G., Jr., North Truro, Mass.....1921
PETERSON, ALFRED, Pipestone, Minn.....1920
PETTY, ORVILLE A., Chapel St. & Sherman Ave., New Haven, Conn..1919

PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....1912
PHELPS, Mrs. J. W., Box 158, Northfield, Mass.....1899
PHELPS. WARREN A., 19 Tennyson Ave., Pittsfield, Mass.....1920
PHILIPP, PHILIPP B., 220 Broadway, New York, N. Y.....1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....1891
PHILLIPS, CHAS., Univ. Minn., Minneapolis, Minn.....1919
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....1912
*PHILLIPS, JOHN M., 2227 Jane St., Pittsburgh, Pa.....1920
PIERCE, FRANKLIN K., Hotel Vendome, Boston, Mass.....1922
PIERCE, FREDERIC J., Winthrop, Iowa.....1922
PIERCE, WRIGHT McEWEN, Box 343, Claremont, Calif.....1918
PILKINGTON, H. GORDON, 26 Taylor St., Providence, R. I.....1922
PILSBURY, FRANK O., 1088 Main St., Walpole, Mass.....1917
PINCHOT, GIFFORD, 912 Real Estate Trust Bldg., Philadelphia, Pa..1910
PINDAR, Dr. L. O., Versailles, Kentucky.....1922
PIRNIE, MILES D., McGraw Hall, Ithaca, N. Y.....1919
PLATT, Hon. EDMUND, 2339 Ashmead Pl., N. W., Washington, D. C. 1917
POE, Miss MARGARETTA, Earl Court, St. Paul and Preston Sts., Baltimore, Md.....1899
POMEROY, F. E., 342 College St., Lewiston, Me.....1920
POOLE, EARL L., Public Museum, Reading, Pa.....1916
POPE, E. F., Box 113, El Reno, Okla.....1920
PORTER, EDGAR F., R. F. D. 2, Athol, Mass.....1922
PORTER, LOUIS H., Stamford, Conn.....1893
PORTER, WILLARD B., 4 Mason St., Salem, Mass.....1922
POST, WILLIAM S., 101 Park Ave., New York, N. Y.....1911
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....1912
POTTER, LAWRENCE B., Gower Ranch, East End, Sask.....1919
POTTER, L. HENRY, R. F. D. 2, West Rutland, Vt.....1922
POTTS, F. A., Central Aguirre, Porto Rico.....1922
POUGH, RICHARD H., 4 Lenox Place, St. Louis, Mo.....1922
POWERS, Miss EVA L., Greenwich Village, R. D., Mass.....1920
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....1892
PRATT, Mrs. ALICE B., 4 Pierce St., Middleboro, Mass.....1922
PRATT, Hon. GEO. D., Pratt Ins'te, 215 Ryerson St., Brooklyn, N. Y. 1917
PRENTISS, Rev. WM. C., Plainfield, Conn.....1921
PRESCOTT, Mrs. CLARA R., 87 High St., Orange, N. J.....1921
PRESCOTT, Mrs. S. C., 249 Tappan St., Brookline 46, Mass.....1922
PRICE, JOHN HENRY, Crown W. Ranch, Knowlton, Mont.....1906
PRICE, LIGON, Marlinton, W. Va.....1913
PRIEST, GEO. H., 33 North Ash St., Brockton, Mass.....1922
PRILL, Dr. A. G., Scio, Oregon,.....1921
PRITCHARD, Mrs. F. A., 203 N. Court St., Medina, Ohio.....1918
PROCTOR, GEORGE N., 35 Congress St., Boston, Mass.....1919
PULITZER, JOSEPH, Jr., St. Louis Post-Dispatch, St. Louis, Mo..... 1921

PURDIE, Miss EVELYN, 49 Ware Hall, 383 Harvard St., Boston, Mass. 1921
PURDY, JAMES B., R. F. D. 1, Plymouth, Mich.....1893
PURDY, WILLIAM B., Milford, Oakland Co., Mich.....1921
QUARLES, EMMET AUGUSTUS, 139 E 7th St., Plainfield, N. J.....1918
QUILLIN, ROY W., 1025 Summit Ave., San Antonio, Tex.....1920
QUINCY, JOSIAH H., 37 Stratford St., Boston 32, Mass.....1922
RACEY, KENNETH, 3262 First Ave., Vancouver, B. C.....1921
RAKER, Miss MARY E., 1484 Sherman St., Portland, Ore.....1918
RAND, FRANK L., 1106 Arcade Bldg., St. Louis, Mo.....1922
RANKIN, GEO. SAMUEL, DR., Longford, St. George's, Bermuda.....1922
RAPP, F. W., Vicksburg, Mich.....1922
RATLIFF, Hon. WALTER S., R. R. B., Box 276, Richmond, Ind.....1918
RAVEN, HENRY CUSHIER, c/o. South Side Bank, Bayshore, N. Y.... 1918
RAYMOND, Miss BESSIE, 564 Diagonal Road, Akron, Ohio.....1920
RAYMOND, O. M., 341 Cuyler St., Princeton, N. J.....1922
REA, Dr. PAUL M., 2717 Euclid Ave., Cleveland, Ohio.....1912
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.. 1896
REED, Mrs. BESSIE, 308 E. 19th St., Lawrence, Kan.....1920
REED, Miss CLARA EVERETT, Brookfield, Mass.....1919
REED, MONTAGUE, 307 Fifth Ave., Rosemont, Montreal, Canada....1921
REESE, Mrs. ROBT. M., 3016 Dumbarton Ave., N. W., Wash., D. C. 1920
REGAR, H. SEVERN, 1400 De Kalb St., Norristown, Pa.....1916
REHN, JAMES A. G., Acad. Nat. Sciences, Logan Sq., Philadelphia, Pa. 1901
REICHENBERGER, Mrs. VICTOR M., Hotel Essex, New York, N. Y.....1916
REID, Mrs. BRUCE, Gulf Refinery, Port Arthur, Tex.....1918
REID, RUSSELL, 210 Thayer St., Bismarck, N. Dak.....1919
REIS, JACOB A., Jr., Edea, Cameroon, W. Africa.....1921
RETT, EGMONT Z., 4236 Julian St., Denver, Colo.....1917
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.....1895
RICE, Miss HELEN M., 149 Columbus St., Elyria, Ohio.....1920
RICE, JAMES HENRY, Jr., Brick House Plantation, Wiggins, S. C.....1910
RICE, WARD J., Roachdale, Ind.....1913
RICH, WALDO L., Box 221, Saratoga Springs, N. Y.....1921
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...1900
RICHARDS, Miss RUTH, Clifton Sta., Fairfax Co., Va.....1921
RICHARDSON, FREDERICK L. W., Jr., Charles River, Mass.....1921
RICHARDSON, JENNESS, 704 Delaware St., Minneapolis, Minn.....1920
RICHARDSON, W. D., 4215 Prairie Ave., Chicago, Ill.....1917
RICHARDSON, WYMAN, 60 West Cedar St., Boston, Mass.....1920
RIDDICK, GEO. M., Hornersville, Mo.....1922
RIDGWAY, JOHN L., Mus. Hist., Sci. and Art, Los Angeles, Calif.....1890
RIES, DONALD T., 401 Thurston Ave., Ithaca, N. Y.....1920
RIIS, PAUL B., 301 Shaw St., Rockford, Ill.....1920
RIKER, CLARENCE B., 432 Scotland Road, South Orange, N. J.....1885
RISHEL, JOHN B., 344 W. Southern Ave., S. Williamsport, Pa.....1922

ROBB, WALLACE H., Cazenovia, N. Y.....1921
ROBBINS, CHARLES A., Onset, Mass.....1914
ROBBINS, Miss ELSIE, 3 Auburn Court, Brookline, Mass.....1922
ROBBINS, REGINALD C., Hamilton, Mass.....1921
ROBBINS, Mrs. REGINALD C., Hamilton, Mass.....1921
ROBERTS, MILES, 756 Kensington Ave., Plainfield, N. J.....1922
ROBERTS, PREWITT, Republic, Mo.....1919
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa.....1902
ROBERTSON, Prof. A. D., Western Univ., London, Ont.....1922
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Calif.....1911
ROBERTSON, JOHN McB., Box 121, Buena Park, Orange Co., Calif...1920
ROBINSON, ANTHONY W., P. O. Box 426, Haverford, Pa.....1903
ROBINSON, Prof. J. M., Box 2641, Auburn, Ala.....1922
ROBINSON, Mrs. L. K., 1130 S. Franklin St., Denver, Colo.....1919
ROBINSON, Miss MARY L., 122 W. 33rd St., Kansas City, Mo.....1919
ROGERS, Miss MABEL F., 11 Fourth Ave., Ottawa, Ontario, Canada..1921
ROGERS, Rev. WALLACE, 801 Vernon St., La Grange, Ga.....1921
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....1896
ROSE, GEORGE C., Ellenville, N. Y.....1920
ROSE, RALPH H., South Kortright, N. Y.....1921
ROSS, GEO. H., 23 West St., Rutland, Vt.....1904
ROSS, Dr. LUCRETIUS H., 507 Main St., Bennington, Vt.....1912
ROSS, REUBEN J., Port Washington, Long Id., N. Y.....1922
ROTNOUR, A. B., 711 Park Ave., Ellwood City, Pa.....1921
ROUSH, GEO. HAROLD, 145 Beverly Ave., Morgantown, W. Va 1919
ROWAN, Prof. WILLIAM, Univ. of Alberta, Edmonton, Alta.....1920
RUGG, HAROLD GODDARD, Dartmouth College, Hanover, N. H.....1919
RUSSELL, JOHN U., 84 Joslin St. Providence, R. I.....1922
RUST, HENRY J., Coeur d'Alene, Idaho.....1918
SACKETT, CLARENCE, Rye, N. Y.....1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....1885
SAGE, Mrs. MARY SEARL, 1974 Broadway, New York, N. Y.....1919
SALYER, J. CLARK, 2412 Main St., Lexington, Mo.....1919
SAMPSON, Dr. JOHN A., 180 Washington Ave., Albany, N. Y.....1920
SAMPSON, Miss MYRA M., 7 Paradise Rd., Northampton, Mass.....1918
SAMPSON, W. B., 1005 N. San Joaquin St., Stockton, Calif.....1922
SANBORN, COLIN C., Field Museum, Chicago, Ill.....1911
SANDERSON, Miss EVA E., 729 Dedham St., Newton Center, Mass...1920
*SANFORD, Dr. LEONARD C., 216 Crown St., New Haven, Conn.... 1919
SANTENS, REMI H., Carnegie Museum, Pittsburgh, Pa.....1918
SATTERTHWAIT, Mrs. A. F., 118 Waverly Place, Webster Groves, Mo. 1920
SAUNDERS, Mrs. E. J., 122 N. Friends Ave., Whittier, Calif.....1921
SAUNDERS, Mrs. K., Creston Road, Berkeley, Calif.....1922
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....1895
SAVAGE, S. O., Parkdale, Ashley Co., Arkansas.....1922

SAVARY, WALTER B., Wareham, Mass.....1922
SAVIN, WILLIAM M., 52 Broadway, New York, N. Y.....1921
SAWYER C. J., 22 Lincoln St., Hudson, Mass.....1920
SAWYER, EDMUND JOSEPH, 1101 E. Genesee St., Syracuse, N. Y.....1922
SCHAEFFER, OSCAR FREDERICK, 669 Genesee St., Rochester, N. Y... 1916
SCHAFER, J. J., Port Bryon, Ill.....1918
SCHANTZ, ORPHEUS M., 1649 Otis Bldg., Chicago, Ill.....1919
SCHEAR, Prof. E. W. E., 107 W. Park St., Westerville, Ohio.....1922
SCHNEIDER, Mrs. G. H., 4618 Kingswell Ave., Los Angeles, Calif....1921
SCHONNEGEL, JULIAN ELIOT, 92 Morningside Ave., New York, N. Y.1918
SCHORGER, A. W., 2021 Kendall Ave., Madison, Wis.....1913
SCHRENCK, Dr. HERMANN VON, Tower Grove and Flad Aves., St. Louis, Mo.....1919
SCHROEDER, Mrs. Adele PARROTT, White River, Mellette Co., S. Dak..1922
SCHRODER, HUGO H., 303 E. State St., Bettendorf, Iowa.....1920
SCOTT, DAVID H., 911 E. Market St., Iowa City, Iowa.....1922
SCOTT, FREDERICK H., 9 Mill St., Westfield, Mass.....1922
SCOTT, Miss JANET RUTH, 2520 Sheridan Road, Evanston, Ill.....1921
SCOVILLE, SAMUEL, Jr.., 415 Lancaster Ave., Haverford, Pa.....1916
SCUDDER, Dr. WALTER H., Litchfield, Medina Co., Ohio.....1920
SEARS, Mrs. GEO. G., 426 Beacon St., Boston, Mass.....1922
SEELEY, GEORGE H., Box 106, Stockbridge, Mass.....1920
SEFTON, J. W., Jr., Room E, Maryland Arcade, San Diego, Cal.....1922
SERRILL, WILLIAM J., Haverford, Pa.....1916
SHA, ROY H., Apt. 38, 1321 Belmont St., N. W., Washington D. C..1920
SHARP, ARTHUR R., 99 Chauncy St., Boston, Mass.....1921
SHAW, HENRY S., Jr., 78 Cypress St., Newton Center, Mass.....1916
SHAW, Dr. J. E. NORTON, Mattapoisett, Mass.....1919
SHAW, T. H., Dept. of Biology, Southeastern Univ., Nanking, China.1922
SHAW, WILLIAM T., 1000 Thatuna St., Pullman, Wash.....1908
SHEA, DANIEL W., Catholic Univ. of Amer., Washington, D. C.....1917
SHEAK, WILLIAM H., Ijamsville, Wabash Co., Indiana.....1921
SHELDON, CHARLES, 1830 Phelps Place N. W., Washington, D. C....1911
SHELDON, H. H., Commercial Tr. Bank, Santa Barbara, Calif.....1919
SHELTON, ALFRED C., c/o Johnson, Shelton Co., Dayton, Ohio.....1911
SHEPARD, JOHN, F., 12 Fairmont Ave., New Haven, Conn.....1922
SHERRILL, WM. E., Haskell, Texas,.....1922
SHERWOOD, ROBERT C., 38 Vassar St., Springfield, Mass.....1920
SHIRLEY, LESTER L., 1414 Buntin St., Vincennes, Ind.....1917
SHIRLING, ALBERT E., 3849 E. 62nd St., Kansas City, Mo.....1919
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....1910
SHOEMAKER, HENRY W., Room 1201, 71 Broadway, New York,.....1912
SHOFFNER, CHAS. P., 17 Rolling R'd, Springfield, Pa., (Rt. 3.) Media1915
SHROEDER, Mrs. A. P., White River, S. Dak.....1920
SHUMWAY, FRANK R., 404 West Ave., Rochester, N. Y.....1920

Silliman, O. P., Cor. Alisal & Riker Sts., Salinas, Calif.....1915
Simons, C. Dewar, III, Peacock Inn Annex., Princeton, N. J.....1920
Simmons, George Finlay, Univ. of Texas, Austin, Tex.....1910
Skeele, Henry B., 116 W. Gaston St., Savannah, Ga.....1922
Skinner, M. P., Yellowstone Park, Wyo.....1916
Slawson, Dr. Edw. Douglass, 407 Center Ave., Bay City, Mich...1921
Sleeper, Lawrence, 198 St. Paul St., Brookline, Mass.....1920
Smith, Austin Paul, Apt. 412, San Jose, Costa Rica.....1911
Smith, Charles E., 261 New Boston Road, Fall River, Mass.....1920
Smith, Mrs. Florence, Box 145, Cincinnatus, N. Y.....1920
Smith, Rev. Francis Curtis, 820 Genesee St., Utica, N. Y.....1903
Smith, Prof. Frank, 1005 West California Ave., Urbana, Ill.....1909
Smith, Henry A. P., Digby, Nova Scotia, Canada.....1921
Smith, Herbert A., 431 N. Van Buren St., Kirkwood, Mo.....1922
Smith, Horace G., 2918 Lafayette St., Denver, Colo.....1888
Smith, Dr. Hugh M., 1209 M St., N. W., Washington, D. C.....1886
Smith, Jesse L., 141 So. 2nd St., Highland Park, Ill.....1920
Smith, Lester W., 60 Cottage St., Meriden, Conn.....1916
Smith, Miss Lottie M., R. F. D. Box 6, So. Sudbury, Mass.....1920
Smith, Napier, Bank of Montreal, Verdun, P. Q., Canada.....1915
Smith, Roy H., 183 N. Prospect St., Kent, Ohio.....1922
Smith, Thomas, 124 Howe St., Methuen, Mass.....1920
Smith, Mrs. Wallis C., 525 N. Mich. Ave., Saginaw, W. S., Mich...1916
Smith, Wendell Phillips, Wells River, Vt.....1919
Smith, Wm. E., Box 167, Bay Shore Road, S. Chatham, Mass.....1922
Smyth, Prof. Ellison A., Jr., Polytechnic Inst., Blacksburg, Va....1892
Smyth, Prof. Thomas, Blacksburg, Va.....1921
Snow, Miss Grace M., 39 Forest St., Winchester, Mass.....1922
Snyder, Lester L., Royal Ont. Mus., Toronto, Ont.....1919
Snyder, Will Edwin, 309 DeClark St., Beaver Dam, Wis.....1895
Spalding, Dr. Fred M., 326 Tappan St., Brookline, Mass.....1922
Spaulding, Nina Gertrude, Jaffrey, N. H.....1922
Spear, H. M., 71 Octavia St., Belleville, Ontario.....1921
Speechly, Dr. H. M., 232 Home St., Winnipeg, Man.....1922
Spelman, Henry M., 48 Brewster St., Cambridge, Mass.....1911
Spencer, Miss C. S., Dept. of Zool., Coe College, Cedar Rapids, Ia..1917
Sperry, Charles C., Biological Survey, Washington, D. C.....1920
Spiker, Charles J., 1808 Cedar St., Sioux City, Iowa.....1921
Sprague, Isaac, Wellesley Hills, Mass.....1920
Stackpole, Fred H., 120 Wellington Hill St., Mattapan, Mass..... 1920
Stanwood, Miss Cordelia Johnson, Ellsworth, Me.....1909
Stebbins, Fannie A., R. F. D. 2, 31 Ely Ave., W. Springfield, Mass..1922
Steele, Henry B., 4530 Drexel Boulevard, Chicago, Ill.....1917
Stephenson, Mrs. Jesse, Monte Vista, Colo.....1918
Stewart, J. B., Roselle, N. J.....1921

STILES, EDGAR C., 345 Main St., West Haven, Conn.....1907
STIMSON, Dr. ARTHUR M., 414 Raymond St., Chevy Chase, Md.....1917
STODDARD, HERBERT L., Milwaukee Public Mus., Milwaukee, Wis...1912
STONE, C. N., 222 Prince St., West Newton, Mass.....1922
STONE, Mrs., FRANCIS H., So. Dartmouth, Mass.....1920
STONE, HARRY HERBERT, Jr., Sturbridge, Mass.....1919
STONE, ROBERT G., 311 Clinton Road, Brookline, Mass.....1922
STONE, Mrs. WITMER, 452 Church Lane, Germantown, Phila., Pa....1920
STONER, Dr. DAYTON, State University, Iowa City, Iowa.....1922
STONER, EMERSON A., Box 444, Benicia, Calif.....1922
STORROW, Mrs. JAMES J., Lincoln, Mass.....1920
STRATTON, Mrs. GEORGE W., 518 Franklin Ave., Wilkinsburg, Pa....1920
STREET, J. FLETCHER, Beverly, N. J.....1908
STREIT, RAYMOND E., 66 Broadway, New York, N. Y.....1921
STRONG, WM. DUNCAN, 209 S. 16th St., Portland, Ore.....1921
STRUTHERS, Rev. ALFRED L., 6 Cottage St., W. Brookfield, Mass.....1922
STRUTHERS, Prof. P. H., 221 Comstock Place, Syracuse, N. Y.....1921
STUART, FRANK A., 118 Green St., Marshall, Mich.....1915
STUART, GEO. H., 3rd, 923 Clinton St., Philadelphia, Pa.....1913
STUBBS, ARTHUR P., 53 Webster St., Lynn, Mass.....1922
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....1896
SUGDEN, ARTHUR W., 35 Concord St., Hartford, Conn.....1913
SUMNER, Mrs. GRAHAM, Linden Ave., Englewood, N. J.....1920
SUTTON, GEO. MIKSCH, Carnegie Mus., Pittsburgh, Pa.....1919
SWAIN, JOHN MERTON, 15 Pleasant St., Farmington, Me.....1899
SWEENEY, J. A., 117 N. State St., Ann Arbor, Mich.....1916
SWEET, Miss ORA D., 45 Logan St., Auburn, N. Y.....1919
SWIFT, JOSEPH B., 46 Mattapan St., Boston, Mass.....1920
SWOPE, Dr. EUGENE, Mt. Healthy, Cincinnati, Ohio.....1921
TALBOT, L. R., Guarantee Trust Co., Paris, France.....1920
TATNALL, SAMUEL A., 503 Hansberry St., Philadelphia, Pa.....1916
TAYLOR, ALEXANDER R., Cayce, S. C.....1907
TAYLOR, ARTHUR W., 24½ Briggs St., Salem, Mass.....1921
TAYLOR, HORACE, 131 Kent St., Brookline, Mass.....1917
TAYLOR, Mrs. H. J., 2815½ Channing Way, Berkeley, Calif.....1922
TAYLOR, L., McDermott, Ohio.....1922
TAYLOR, LIONEL E., Bankhead, Kelowna, B. C.....1913
TAYLOR, Dr. WALTER P., Box 402, University Station, Tucson, Arizona1916
TAYLOR, WARNER, 219 Clifford Court, Madison, Wis.....1916
TEACHENOR, DIX, 510 Rialto Bldg., Kansas City, Mo.....1919
TEE-VAN, JOHN, N. Y. Zoological Park, New York, N. Y.....1921
TERRELL, CLYDE B., 83 Monument Sq., Oshkosh, Wis.....1920
TERRILL, LEWIS McI., 44 Stanley Ave., St. Lambert, Quebec.....1907
TERRY, Miss ALICE P., 89 State St., New Bedford, Mass.....1920
TERRY, Dr. ROBERT J., 9 Lenox Place, St. Louis, Mo.....1919

TEST, Dr. FRED'K C., 4620 Greenwood Ave., Chicago, Ill.....1920
THABES, Mrs. J. A., 417 Holly St., Brainerd, Minn.....1920
THOMAS, EDWARD S., 1116 Madison Ave., Columbus, Ohio.....1922
THOMAS, GERALD B., Box 1124, Billings, Mont.....1919
THOMAS, JOHN G., 1200 Niagara St., Buffalo, N. Y.....1921
THOMAS, R. M., 298 Garry St., Winnipeg.....1922
THOMPSON, J. W., 527 East First South St., Salt Lake City, Utah...1916
THOMPSON, STUART L., 529 Roxton Road, Toronto, Ontario.....1921
THOWLESS, HERBERT L., 765 Broad St., Newark, N. J.....1919
THWING, GRACE E., George School, Bucks Co., Pa.....1922
TILLISCH, Miss MARY A., 10 Bedford St., S. E., Minneapolis, Minn...1922
TILTON, J. O., 1 Elm Ave., Lexington, Mass.....1922
TINDALL, CHAS. W., 912 N. Noland St., Independence, Mo.....1919
TINKER, ALMERIN D., 519 Oswego St., Ann Arbor, Mich.....1907
TIPPETTS, Mrs. KATHERINE B., Belmont Hotel, St. Petersburg, Fla..1921
TITUS, W. H., Ellsworth, Maine.....1922
TOLFREE, EDWARD R., 71 W. 11th St., New York, N. Y.....1921
TOMLINSON, IRVING C., 8 West Hill Place, Boston, Mass.....1920
TOOTH, Mrs. OLLIE, Litchfield, Medina Co., Ohio.....1921
TORREY, Miss EDITH E., 164 Huntington Ave., Boston, Mass.....1920
TOWER, Mrs. KATE D., 541 Boylston St., Boston, Mass.....1908
TOWLE, WILLIAM M., Box 444, Enosbury Falls, Vt.....1921
TOWNE, Dr. SOLON RODNEY, Benson Station, Route 2, Omaha, Neb..1919
TOWNSHEND, HENRY H., 35 Hellbourne Ave., New Haven, Conn....1915
TREGANZA, A. O., 522 S. 13th East St., Salt Lake City, Utah.....1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....1899
TRUE, GEO. L., Jr., 36 Masonic St., Rockland, Maine.....1922
TRUESDELL, JOHN F., 230 Post Office Bldg., Denver, Colo.....1918
TRUMBELL, J. H., 39 Farmington Ave., Plainville, Conn.....1907
TUDBURY, WARREN C., 1939 Marin Ave., Berkeley, Calif.....1903
TUFTS, Miss MARY I., 1 Atlantic St., Lynn, Mass.....1922
TUFTS, ROBIE W., Wolfville, Nova Scotia.....1919
TULLOCK, Mrs. GILBERT, 379 Edgewood Ave., New Haven, Conn....1919
TURNER, WARREN H., 16 Greendale Ave., Worcester, Mass.....1920
TUTTLE, Mrs. F. MAY, 1114 State St., Osage, Iowa.....1920
TUTTLE, HENRY EMERSON, Groton School, Groton, Mass.....1909
TWITCHELL, A. H., Flat, Alaska.....1918
TYLER, JOHN G., Box 173, Fresno, Calif.....1912
TYRRELL, W. BRYANT, 1110 So. 4th Ave., Maywood, Ill.....1922
UFFORD, Dr. EUGENE U., Auburndale, Mass.....1922
UNDERDOWN, HENRY T., 401 Chestnut St., Philadelphia, Pa.....1921
UNDERWOOD, WM. LYMAN, Mass. Inst. of Tech., Cambridge, Mass.. 1900
UPHAM, CHARLOTTE P., Rowley, Mass.....1922
URNER, CHARLES A., 613 Cleveland Ave., Elizabeth, N. J.....1920
VALENTINE, Miss ANNA J., Bellefonte, Pa.....1905

*VANDERGRIFT, S. H., 311 Riggs Bldg., Washington, D. C.....1918
VAN LOON, GORDON E., 209 Tyler Ave., Highland Park, Mich.....1922
VAN NAME, WILLARD G., Am. Mus. Nat. Hist., New York, N. Y....1900
VAN TYNE, J., 1942 Cambridge Road, Ann Arbor, Mich.....1922
VARICK, Dr. WM. REMSEN, 97 Prospect St., Manchester, N. H.....1920
VARS, HAROLD N., Biological Survey, Washington, D. C.....1921
VETTER, Dr. CHARLES, 67 West 12th St., New York, N. Y.....1898
VICKERS, E. W., Berlin Center, Ohio.....1921
VIERECK, HENRY L., Biological Survey, Washington, D. C.....1916
VON LENGERKE, JUSTUS, 257 Highland Ave., Orange, N. J.....1907
VORHIES, Dr. CHAS. T., Univ. of Ariz., Tucson, Ariz.....1918
VOSS, FRED. W., 190 Underhill Ave., Brooklyn, N. Y.....1922
WADSWORTH, CLARENCE S., 27 Washington St., Middletown, Conn..1906
*WALCOTT, FREDERICK C., 17 E. 42nd St., New York, N. Y.....1921
WALCOTT, ROBERT, 152 Brattle St., Cambridge, Mass.....1922
WALKER, EDITH F., 614 County St., New Bedford, Mass.....1920
WALKER, ERNEST P., Juneau, Alaska.....1918
WALKER, GEO. R., R. D. 3, Murray, Utah.....1909
WALLACE, CHAS. R., 69 Columbus Ave., Delaware, Ohio.....1913
WALTER, Dr. HERBERT E., 67 Oriole Ave., Providence, R. I.....1901
WALTERS, FRANK, 144 E. 59th St., New York, N. Y.....1902
WARD, FRANK H., 18 Grove Place, Rochester, N. Y.....1908
WARD, HENRY B., State University, Urbana, Ill.....1922
WARD, HENRY L., Kent Scientific Museum, Grand Rapids, Mich...1906
WARNER, EDWARD P., 9 Elmwood Ave., Cambridge, Mass.....1910
WARREN, Dr. BENJAMIN H., 220 W. Market St., West Chester, Pa...1922
WARTHEN, ALFRED SCOTT, Jr., 1020 Ferdon Rd., Ann Arbor, Mich...1922
WATERMAN, Miss MARY E., Williamstown, Vt.....1921
WATERMAN, WILLARD H., Auburn, Me.....1920
WATSON, C. G., 201 Ridout St., S., London, Ont.....1919
WATSON, JAMES D., 6047 Harper Ave., Chicago, Ill.....1920
WEBER, J. A., 151 Grand Ave., Leonia N. J.....1907
WEBSTER, Dr. GEORGE A., Roxbury, Mass.....1916
WEBSTER, Mrs. JENNIE E. B., 44 E. 23rd St., New York, N. Y.....1917
WEEKS, E. C., Sanbornton, N. H.....1922
WEEKS, Rev. LEROY TITUS, Emmetsburg, Iowa.....1918
WEGENER, Mrs. MIRIAM, 119 Waverly Place, Webster Groves, Mo.. 1921
WEISEMAN, T. WALTER, 226 Beaver Road, Emsworth, Pittsb'gh, Pa. 1919
WEISER, CHARLES S., 105 W. Springettsbury Ave., York, Pa.....1916
*WELLMAN, GORDON B., 17 Midland R'd., Wellesley, Mass.....1908
WELLS, Miss CAROLINE, 502 S. 4th St., W, Missoula, Mont.....1920
WELLS, HERBERT R., 260 Federal Bldg., Rapid City, S. Dak.....1922
WEST, CHAS. SLADE, Marianna, Fla.....1919
WETMORE, Mrs. EDMUND H., Box 497, Babylon, N. Y.....1902
WEYGANDT, Dr. CORNELIUS, 6635 Wissahickon Ave., Philad'a, Pa...1907
WEYL, EDWARD S., 6506 Lincoln Drive, Mt. Airy, Phila., Pa.....1921

*WHARTON, WILLIAM P., Groton, Mass.....1907
WHEELER, EARLE A., East Randolph, Catt. Co., N. Y.....1922
WHEELER, Mrs. JAMES W., 403, 15th Ave., N., Seattle, Wash.....1918
WHEELER, WM. CUMMINGS, 68 Pleasant St., East Walpole, Mass....1922
WHEELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....1922
WHITE, DONALD, 28 Byron St., Wakefield, Mass.....1920
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....1891
WHITE, GEORGE R., 185 Wurtemberg St., Ottawa, Canada.....1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....1902
WHITING, WILLARD C., 584 Plymouth St., E. Bridgewater, Mass.... 1920
WHITING, WM. J., Hotel Potomac, Washington, D. C.....1922
WHITING, Mrs. WM. J., Hotel Potomac, Washington, D. C.....1922
WHITMAN, F. N., 56 Wendell St., Cambridge, Mass.....1919
WHITMAN, ROGER C., 314 Nassau Blvd., New Hyde Park, N. Y.....1922
WHITNEY, GEOFFREY G., Highland St., Milton, Mass.....1920
WHITNEY, HOWARD, 45 East St., Hartford, Conn.....1921
WHITNEY, THOMAS H., Atlantic, Iowa..... 1920
WHITTLE, CHARLES L., 50 Congress St., Boston, Mass.....1916
WHITTLE, Mrs. H. G., 50 Congress St., Boston, Mass.....1904
WICKS, Mrs. JUDSON L., 1911 Pillsbury Ave., Minneapolis, Minn....1922
WIEGMANN, Dr. WILLIAM HENRY, 436 E. 5th St., New York, N. Y..1916
*WIGGLESWORTH, Dr. EDW., Boston Soc. Nat. Hist., Boston, Mass.. 1920
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....1895
WILCOX, T. FERDINAND, 118 E. 54th St., New York, N. Y.....1895
WILEY, Miss LENA CATHERINE, Buckland, Mass.....1918
WILLARD, BERTEL G., 51 Fresh Pond, P'kway, Cambridge, Mass....1906
WILLARD, FRANK C., Farmingdale, N. Y.....1909
WILLARD, OSCAR T., 1444 E. 54th St., Chicago, Ill.....1919
WILLCOX, Miss M. A., 63 Oakwood Road, Newton, 60, Mass.....1913
WILLIAMS, LAIDLAW, 152 W. 57th St., New York, N. Y.....1919
WILLIAMS, LEWIS B., 706 Citizens Bld'g, Cleveland, Ohio.....1920
WILLIAMS, ROBERT S., N. Y., Botanical Gardens, New York, N. Y..1888
WILLIAMSON, E. B., Bluffton, Ind.....1900
WILLIS, Mrs. HERBERT B., 425 Tremont St., Taunton, Mass.....1920
WILLWARTH, E. S., 11 Lincoln Hall, Trinity Court, Boston 17, Mass.1920
WILMOT, NELSON E., 40 Marshall St., West Haven, Conn.....1916
WILSON, Mrs. ETTA S., 9077 Clarendon Ave., Detroit, Mich.....1917
WILSON, Dr. FRANK NORMAN, 804 Lawrence St., Ann Arbor, Mich...1922
WILSON, GORDON, 1434 Chestnut St., Bowling Green, Ky.....1919
WINANT, ALBERT, 194 Maple Ave., Great Barrington, Mass.....1922
WING, DEWITT C., 5344 Dorchester Ave., Chicago, Ill.....1913
WINGARD, TOD ALBERT, 1173 Say Ave., Columbus, Ohio..... 1918
WINTER, DWIGHT, Center and Negley Aves., Pittsburgh, Pa.....1922
WISE, Miss HELEN D., 1930 18th St., N. W., Washington, D. C.....1919
WOLFE, Mrs. A. C., c/o Mrs. H. C. Corse, 10 Ford Place, Pasadena, Calif.....1922

WOLFE, Lieut. L. R., 26th U. S. Infantry, Plattsburg, N. Y.....1922
WOLFE, PATRICK R., 6732 Honore St., Chicago, Ill.....1921
WOOD, Dr. GEORGE B., 1830 Spruce St., Philadelphia,, Pa.....1916
WOODMAN, Dr. WALTER, 14 Hubbard Park, Cambridge, Mass.....1920
WOODRUFF, FRANK M., Acad. of Sciences, Lincoln Park, Chicago, Ill..1894
WOODRUFF, LEWIS B., 14 E. 68th St., New York, N. Y.....1886
WOODWARD, Dr. LEMUEL F., 52 Pearl St., Worcester, Mass.....1917
WOOLMAN, Miss ANNA, 21 N. Highland Ave., Lansdowne, Pa.....1920
WORCESTER, Mrs. ALFRED J., 314 Bacon St., Waltham, Mass.....1908
WRIGHT, FRANK S., 14 Cayuga St., Auburn, N. Y.....1917
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich1907
WRIGHT, Miss MARY A., 33 Kirkland St., Cambridge, Mass.....1920
WRIGHT, Mrs. PAULINE FAY, Church Road, Fox Chase, Phila., Pa...1921
WYMAN, Mrs. FRANCES L., Hubbardston, Mass.....1920
WYMAN, LUTHER E., 3965 Dalton Ave., Los Angeles, Calif.....1907
YOUNG, Rev. CHAS. JOHN, Brighton, Ont., Canada.....1918
YOUNG, FRANCIS E., Hanover, Mass., (R. F. D. Rockland).....1920
YOUNG, JOHN P., Ithaca, N. Y.....1911
YOUNG, Mrs. PAULINE R., Canille, Ariz.....1922
ZIEGLER, G. FRED Jr., Greencastle, Pa.....1920
ZUCKERMAN, JOSEPH, Am. Mus. Nat. Hist., New York, N. Y.....1919
ZUTAVERN, LOUIS J., 2370 Forest Ave., Great Bend, Kas.....1921

THE AUK

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MEETINGS OF THE A. O. U.

Since its organization in 1883 the American Ornithologists' Union has held one special and 40 annual meetings.

Meeting	Date	Place	Fellows Present	Total Membership
1	1883, Sept. 26–28	1st New York	21	23
2	1884, Sept. 30–Oct. 2	2d New York	16	143
3	1885, Nov. 17–18	3d New York	16	201
4	1886, Nov. 16–18	1st Washington	20	251
5	1887, Oct. 11–13	1st Boston	17	284
6	1888, Nov. 13–15	2d Washington	20	298
7	1889, Nov. 12–15	4th New York	20	400
8	1890, Nov. 18–20	3d Washington	20	465
9	1891, Nov. 17–19	5th New York	14	493
10	1892, Nov. 15–17	4th Washington	20	557
11	1893, Nov. 20–23	2d Cambridge	17	582
12	1894, Nov. 12–15	6th New York	15	616
13	1895, Nov. 11–14	5th Washington	19	667
14	1896, Nov. 9–12	3d Cambridge	14	673
15	1897, Nov. 8–11	7th New York	18	679
16	1898, Nov. 14–17	6th Washington	21	695
17	1899, Nov. 13–16	1st Philadelphia	16	744
18	1900, Nov. 12–15	4th Cambridge	19	748
19	1901, Nov. 11–14	8th New York	18	738
20	1902, Nov. 17–20	7th Washington	25	753
20a	1903, May 15–16	1st San Francisco	7	—
21	1903, Nov. 16–19	2d Philadelphia	19	775
22	1904, Nov. 28–Dec. 1	5th Cambridge	17	808
23	1905, Nov. 13–16	9th New York	17	860
24	1906, Nov. 12–15	8th Washington	24	750
25	1907, Dec. 9–12	3d Philadelphia	20	850
26	1908, Nov. 16–19	6th Cambridge	17	888
27	1909, Dec. 6–9	10th New York	19	866
28	1910, Nov. 14–17	9th Washington	23	897
29	1911, Nov. 13–16	4th Philadelphia	18	887
30	1912, Nov. 11–14	7th Cambridge	18	929
31	1913, Nov. 10–13	11th New York	28	992
32	1914, Apr. 6–9	10th Washington	27	1101
33	1915, May 17–20	2d San Francisco	11	1156
34	1916, Nov. 13–16	5th Philadelphia	26	830
35	1917, Nov. 12–15	8th Cambridge	21	891
36	1918, Nov. 11	12th New York	14	953
37	1919, Nov. 10–13	13th New York	28	1024
38	1920, Nov. 8–11	11th Washington	25	1142
39	1921, Nov. 7–10	6th Philadelphia	25	1351
40	1922, Oct. 23–27	1st Chicago	24	1457

The next regular meeting—the 41st Stated—will be held at Cambridge, Mass., October 8–11, 1923.